Design Report

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Timothy Penfold PNFTIM001

Contents

Preface

This document begins with a theory paper written in the first half of this year before moving on to images, charts, and graphs that have informed and inspired my project. It then offers answers to these fundamental questions relating to my chosen design project: Where? Why? What? and How?

Before I move on to this, a brief description of the final design direction to locate the reader...

The construction of a *Theatre of Atmospherics* located at the main breakwater of Cape Town harbour. This Theatre consists of four elements;,
_a weather device;
_a research facility for the South African National Antarctic Programme (SANAP);
_a 'shifting' communal space for the research facility;
_and the theatre itself.

The weather device is located at the end of the breakwater. It is a visual communicator that once again connects the people of Cape Town with the sea through its foreshadowing of the weather.

The SANAP research facility is composed of office space, research labs, meeting spaces, conference facilities and a visitor centre and is located along, and protected by, the breakwater.

The shifting communal space runs on tracks along the breakwater and is controlled by the ebb and flow of the tides. It is a resource centre for the research labs. During severe storm events it shifts to the landward end of the breakwater, closing it off to the public and activating the theatre.

The above elements find a connector in the theatre. This is a space located at the entrance to the breakwater. It houses machinery (cogs, wheels, pulleys and ropes) that connect the weather device to the shifting communal space. It forms an entrance gateway to the breakwater which now becomes open to the public. The machinery forms a mechanical expression of the weather as registered by the weather device. During severe storm events the shifting communal space of the research facility gets pulled all the way to the theatre, closing the breakwater off whilst completing and activating the theatre. The theatre now becomes a stage to present all the work the SANAP researchers have been doing in Antarctica, displaying their findings to the public making them aware not only of the beauty and fragility of Antarctica, but also of its effect on the weather in Cape Town.

Introduction

This is a project about wind, about tidal cycles, about manufactured landscapes, about man–made and natural erosion, about myths, about materials, about making, about atmospherics, about shelter, about storms, about gradients of space, about boundaries, about threatened landscapes, about fields of influences, about site conditions in all their messiness, about weather systems in all their unpredictability...

Opposite page. General Plan of Table Bay Harbour of 1895. Source: Table Bay Harbour Board: A short account of the construction of harbour works in Table Bay from 1656 to 1895, pg. 1


GENERAL PLAN
OF
TABLE BAY HARBOUR
SOUTH AFRICA
1895.
SCALE
EAST PIER
AUTHORIZED OUTER HARBOUR
AREA 64 ACRES.
OUTER BASIN
INNER BASIN
QUARRY SITE

Interiors

Opposite page. 'Vasco da Gama encounters Adamastor at the Cape of Good Hope' by Emilio Biel. Source: (Biblioteca Nazional, Lisbon) in Hoerikwaggo: Images of Table Mountain, pg. 54. .

The wind is a wonderfully elusive force. We tend to know it not for what it is intrinsically but rather for what its effects are – what it does to 'stuff'. I know it is windy because I feel the air forced against my body, I hear the distorted turbulence of sound waves as they enter my ear–drums, I can see the leaves and sand being blown across the ground. Volcanic ash is swept across Europe and the Kenyan fresh–flower market crashes. The interminable wind blows through 19th century Wyoming resulting in the 'wind–induced insanity' defence and a man is acquitted of murder[1]. Wind, therefore, is not present, its effects, however, are.

The history of the Cape shares this entanglement with the effects of wind. We know from names such as: *The Cape of Storms*, *Cape of Good Hope* and *Tavern of the Seas* that this area is viewed in reference to its location in a climatically hostile environment. Although there may have been ulterior motives behind these names (the suggestion perhaps that the name *Cape of Storms* was a Portuguese ruse to deter any would–be colonisers from even attempting a rounding of the Cape[2]), they certainly seem to attest to the almost mythical experience associated with siting and

[1] DeBlieu, *Wind: How the flow of air has shaped life, myth and the land*, 181

[2] Vergunst, *Hoerikwaggo: Images of Table Mountain*, 57

landing at the Cape after months spent at the weather's mercy aboard ships. This mythology of the Cape as embodiment of weather perhaps found its most lyrical expression in Camões' *Luciads* where the imposing figure of Adamastor inhabits Table Mountain – an embodiment of the medieval fears of 'the dark continent' being tamed by 'Enlightened Man'. These images, are now seen as Eurocentric techniques of justifying an attempt to 'tame' and impose colonial rule on a 'hostile' continent, for, as Stephen Gray notes, 'the figure of Adamastor is at the root of all the subsequent white semiology invented to cope with the African experience: he is menacing and inimical, and seen across a barrier...'[3].

This barrier appears to have been threatened by the weather when Jonathan Hill speaks about flood tides in relation to 17th century Dutch notions of interiority and the self. Hill likens the establishment of the home to the fortifying of the self[4]; a safe and predictable home being some sort of protection against a threat to the self. By acknowledging and strengthening this notion of home, the opposite of itself, the outside, or that which is unknown takes on more importance and power. Quoting Banister Fletcher

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[3] Gray, Southern African Literature, an Introduction, cited by Vergunst, 55

[4] Hill, Immaterial Architecture, 8–9

Hill reminds us of the supposed origins of architecture when he says:

> *Architecture...must have had a simple origin in the primitive efforts of mankind to provide protection against inclement weather, wild beasts and human enemies.*[5]

To protect against the outside combines the ideas of weather and enemy and links the interiority of a physical object (the house, and psychologically the home) with the conception of the self (identity) when Hill notes:

> *For psychological as well as physical comfort, the threshold between inside and outside must be clear. A threat to the home is considered a threat to the self.*[6],

and

> *...threats from the outside and outsider merged in the flood tide, the most disturbing natural force in the Dutch landscape.*[7]

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[5] Fletcher, A History of Architecture on the Comparative Method, 1

[6] Hill, 9

[7] Ibid.

These recurring flood tides were results of storm surges that occurred frequently enough for them to become ingrained in the Dutch psyche. Although recurring, they were still unpredictable, and in constant flux, taking on material and immaterial qualities. When the floods came they both swept the streets clean of detritus but also, on a more psychological level, brought the threat of the outside uncomfortably close to home, thus serving a dual role, whilst consolidating the need to protect the interior.[8]

These phenomena are discussed against a 17th century Dutch nation that was increasingly being exposed to outsider cultures, peoples and landscapes (amongst them the 'Cape of Good Hope') through the commercial activities of the Dutch East India company. We can surmise, based on contemporary depictions of the Cape, that fantastical tales of Eden–like landscapes inhabited by barbarous peoples (or, more importantly and alarmingly, sometimes no people at all) were sent back to the '*home*land' further heightening the Dutch distrust and fear of the outside and consequently reinforcing the importance of a stable and predictable interior.

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[8] Hill, 10

This page. 'A man and woman at the Cape of Good Hope' by Sir Thomas Herbert. Source: (MuseumAfrica, Johannesburg) in Hoerikwaggo: Images of Table Mountain, pg. 60

These exaggerated and fantastical accounts and the various maps that accompanied them can be seen as representations of "...white lies, which denied one was living in someone else's country."[9]

Perhaps an exaggerated and preposterous account served to distance the coloniser's sense of self and protect them from an 'other' which seemed strange, unfamiliar, yet at the same time strangely familiar, being, as they were, legitimate inhabitants of the land.

This 'uncanny' is elucidated by Anthony Vidler when he says

> *Its [the uncanny's] favourite motif was precisely the contrast between a secure and homely interior and the fearful invasion of an alien presence; on a psychological level, its play was one of doubling, wherethe other is, strangely enough, experienced as a replica of the self, all the more fearsome because apparently the same.*[10]

The idea of the architectural uncanny is bound up with the concept of the domestic interior as witnessed in the German word *unheimlich* – unhomely and its

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[9] Verguunst, 43

[10] Vidler, The Architectural Uncanny, 3

progenitor *heimlich* – homely. This served as the basis for Heidegger's treatise on what it meant *to dwell* in the world in *Building, Dwelling, Thinking*. Mark Rakatansky, in a paper written for *Building, Dwelling, Drifting: Migrancy and the Limits of Architecture*[11], takes the phrase 'to dwell' but uncovers a different etymology – one that Heidegger seemingly suppressed. To dwell, he says, referring to the Old English *dwellen* means *to lead astray, hinder.*[12] And, in the Old Norse, *dvelja* means *to delay* or *to deceive.* Further, by quoting the anthropologist Gillian Feeley–Harnik, Rakatansky speaks of the Sakalava, a Madagascan tribe who would not "...refuse another entrance into his house unless he were hoarding or hiding something", being represented in their word *mody* which means *at home* or *heading home* but which also means *to pretend what one is not.*[13] We can see from these derivations a link between physical barriers, that is; walls/ enclosure, and a psychological distancing from that which is outside of those walls. Interestingly, it seems that in order to dwell one necessarily has to view oneself as the outsider, as the protagonist of this waylaying.

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[11] A conference on postcoloniality/ globalisation/ migrancy

[12] Rakatansky. 99–100

[13] Feeley–Harnik, cited in Wilson,98

If we look at the local inhabitants of the Cape around the time of the first European explorers we notice a similar linguistic phenomenon.

(Often referred to simply as 'hottentot' or 'bushman' by the Dutch, this simplistic designation belied a more complex structure of differing tribes inhabiting this region. The word *hottentot* was adopted in Europe around this time to refer generally to 'the other' in a derogatory way.[14] One can still see this word in use today as a referent to a technically and culturally stunted person as shown in a recent interview in the New York Times.[15])

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[14] Parkington, Shorelines, Strandlopers, and Shell Middens, 17

[15] Rosenthal, "Europe finds cleaner energy in trash, U.S. lags," New York Times, April 12, 2010

Now, if we look at the linguistics of the local inhabitants we find a much more diverse set of names for all the different tribes that settled or roamed this area. Temporary dwellings existed on the Table Bay coast. These structures belonged to the *Khoi* (more recently *Khoe* or *Quena*) people.[16] These people were herders, owning vast numbers of cattle and sheep. Existing simultaneously were another grouping, the *sonqua*. This name seems to have appeared in 1660 as used by an employee of the VOC, Jan Dankaert, on one of his expeditions north. Its derivation isn't clear but the word applies to "a band of 'small people' from whom he (Dankaert) received fish and dassies."[17] Because he was led on these expeditions by members of the Khoe tribe it is understood that this name, sonqua, is derived from the Khoe language. This name, based on word lists gathered in the 17th century, has different meanings, amongst them: *bush*, *to gather*, *aboriginal*, *people without property* and even *robber*.[18]

What is interesting to note here, is the name applied to a mobile and *house*less people by those with a fixed (although tenuously so) abode links the words

Opposite page. 'Cabo de Goede Hoop', by Abraham Bogaert. Source: (MuseumAfrica Johannesburg) in Hoerikwaggo: Images of Table Mountain, pg 23.

[16] Worden, "Space and Identity in VOC Cape Town," Kronos (1998/99): 72
[17] Parkington, 17
[18] Parkington, 18

'robber' with 'homeless'. Here, as opposed to linking the home with concealment, as can be seen in the words *heimlich* and *mody,* there emerges a link between that which hasn't a home and a fear of the home being compromised. Here, the protagonist is the outsider, the thief, whilst those with homes are seen as 'innocent'. The house and home and those within are now viewed as different from that which they protect against, the weather and the thief.

Filters

It is generally assumed that a primary concern of architecture is shelter. This concern soon transformed from being one of keeping the outside out, to one of viewing the outside from within, for, as Beatriz Colomina stated:

> *The house is a device to see the world, a mechanism for viewing. Shelter, separation from the outside, is provided by the window's ability to turn the threatening world into a reassuring picture.*[19]

Now, there is an interesting distance between Colomina's sense of shelter and Banister Fletcher's. When looking at Fletcher's conception, he is speaking about a primary concern of keeping the elements out. A building acts as protection and a barrier. Colomina, speaking, of course, not about the origins of building as Fletcher did, but rather about domestic interiors, views the elements, and their relation to the interior differently. The house is now viewed not as a barrier keeping the unwanted out, but rather a device for mediating the passage to the interior of the exterior for the pleasure of those indoors. This points to a fundamental shift in the way the exterior is *viewed*.

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[19] Colomina, Privacy and Publicity, in Hill, Immaterial Architecture, 15

This contemplation of the *out of doors* is entangled in theories of the *picturesque* and the concomitant thoughts of aesthetic appreciation and taste.

Writing in the 1750's the English philosopher Edmund Burke expanded upon a position that saw aesthetics as merely organic sense–experience.[20] This position denied the presence of reasoning in the appreciation of aesthetics. Burke continues by adjudging vision the most important sense with which to find beauty. As Adrian Forty notes in reference to Burke:

> *...not only does it [the picturesque] concentrate upon the effect of retinal sensations, but it proposes that pictures can enable the eye to find beauty even where, in life, the other senses might be repulsed.*[21]

This favouring of the eye in relation to aesthetics is fundamental to Richard Payne Knight's treatise; *An Analytical Enquiry into the Principles of Taste (1806).* Knight suggests that taste is developed through breeding and requires the beholder to possess a large knowledge of experiences termed 'ideas' which are gained through exposure to images.[22]

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[20] Forty, Common Sense and the Picturesque, 177
[21] Forty, 178 – 179
[22] Forty, 179 – 181

This privileged taste–based order of aesthetics came under attack, as Forty points out, by nineteenth century critics such as John Ruskin, Viollet–le–Duc and Gottfried Semper. These thinkers opened up architectural criticism to reasoned argument and their ideas "were fundamental to the development of modernism".[23] He goes further to suggest that

> *[common sense (vision)] as an account of aesthetic experience [...] is entirely contrary to the tradition of European modernism, where it is assumed that the mind is fundamental to the appreciation of architecture.*[24]

This suggestion is contested by those who liken the modernist pavilion to the picturesque garden, among them, Caroline Constant, and Jonathan Hill when he states "the pleasure of perception is the purpose of the eighteenth–century picturesque garden and the twentieth–century modernist Pavilion."[25]

This statement is Hill's way–in to his rereading of the Barcelona Pavilion. In an attempt to breathe new life into Mies' pavilion and to expose or arouse that which he believes is sorely lacking he proposes an invasion of foreign weather. The weather systems

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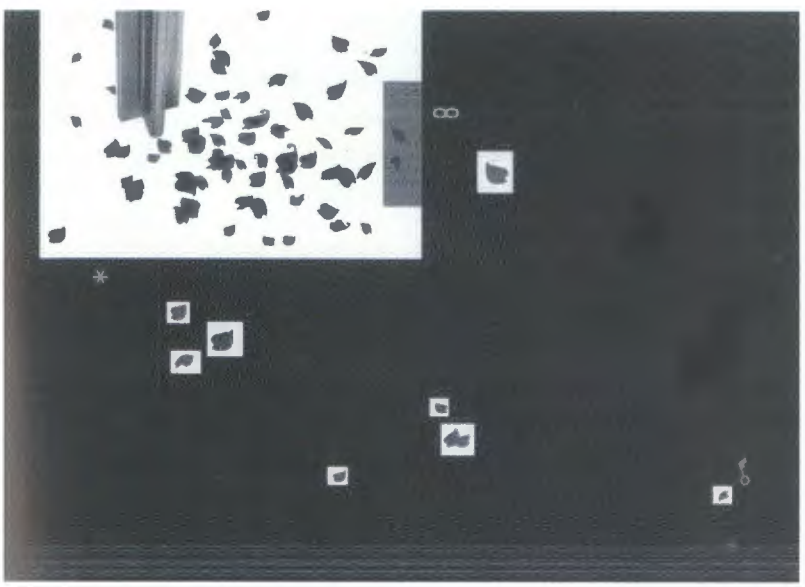
[23] Forty, 183
[24] Forty, 178
[25] Hill, 135–137

present in Berlin during the construction of the pavilion in Barcelona in 1929 will be artificially transplanted in to the new 1986 pavilion breaking down the perception of the pavilion as work of art and object for contemplation and return it to the realm of building, by engaging the user beyond mere contemplation.

It is interesting to note that Hill's device in sequestrating architecture from the realm of contemplative art is the use of weather. Hill decisively states,



The exclusion of weather is a fundamental purpose of the building. But I use weather as an architectural material First, as a metaphor of the outside pouring into the discipline of architecture...[26]

Opposite page: 'An Original Copy, 1998. Berlin 10.03am 14 January 1930 - Barcelona 10.03am 14 January 2000. Internal Travertine Floor: snow (Be), 23 knot east wind (Be), haze (Be).' Source: Hill, Weather Architecture, pg.65.

So, to recap, we see a correlation between the 'pleasurable perceptions' of viewing picturesque gardens and contemplating certain modernist buildings (Mies' Barcelona Pavilion as Hill suggests). This implies reading these phenomena from a certain distance, or, through certain filters. What interests me is the idea of a filter affecting the way the environment is perceived. In the picturesque garden these filters[27] offer up the landscape to pleasurable 'retinal sensations', a decidedly indulgent activity, whereas it could be used to change people's awareness of the environment.

The work of Smout Allen utilises architecture as a device for just such a purpose (their work to be discussed later).

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[26] Hill, Weather Architecture, 69

[27] An example could be the Claude Glass as discussed in Hill, Immaterial Architecture, 148 – 149

Gradients

Shelter emphasises a membrane or barrier making a clear distinction between inside and outside. A clear and impermeable barrier is needed to keep the unpredictable weather out and to provide a predictable and mediated internal atmosphere. This has served to ingrain a conception of space as being bounded by matter. Space becomes internal *or* external separated by a shell, a surface. Thus, when speaking about weathering we generally refer to effects upon a surface.

Of course this clear boundary between the exterior and the interior has been exacerbated in the last century due to devices that regulate internal atmospheres making the ubiquitous glass skyscraper a reality. Invented in the early twentieth century, the air–conditioner is a prime example of what Reyner Banham terms 'regenerative modulation'.[28] Ironically, it is precisely this, 'regenerative modulation' that Banham suggests can emancipate architecture from its habitual methodology based on ingrained and antiquated responses to shelter.

Banham's text has enjoyed a renewed interest of late in its foreshadowing of what now is termed 'heterogeneous space' (to be discussed later).

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[28] Banham, The Architecture of the Well–Tempered Environment, 26

As an example of regenerative environmental modulation Banham tells a fictional tale of two tribes. Both tribes are faced with the prospect of spending the night without shelter. When a pile of dry wood is discovered the first tribe contemplates their position and decides to expend some energy in fashioning the wood into a temporary structure to protect them against the cold. The second tribe provides a possibly more short–sighted, but, for the purposes of his essay, a more interesting solution. They simply build a fire. This provides them with heat, light, and a focal point for their gathering. What Banham identifies in this solution is the gradients of spatial qualities produced by the fire. As opposed to simply an external condition and internal condition in the former example, the fire provides rings of heat, that allow for different activities to take place around its source. Further, an unwanted by–product of the fire, smoke, is blown in a certain direction making certain areas of the encampment undesirable. This leads to a rich and fluid sense of space.

In the above example, Banham speaks about a fictional tribe. He does so in order to draw attention to his main topic – gradients of space – without the need to specify a particular people who may have been involved in this practice. I wish to now mention a decidedly real 'tribe' who, I propose, invoked

gradients of space in a similar manner. As mentioned previously, there were two main peoples inhabiting the southern Cape when the first European settlers arrived. These people can be loosely grouped as 'hunter–gatherers' and 'herders'. But, there is also evidence of a third type of inhabitant: the strandloper. Opinion is divided on whether the strandloper represents a different group or whether they were part of the sonqua hunter–gatherers.[29] What is known is that for millennia the shoreline of modern day South Africa was the life–blood of many societies that made use of its abundant source of food, for as Nigel Parkington states:

> *Coastlines are the most obvious, the most dramatic and, in many ways, the most productive of ecotones, regions lying at the interface between major ecosystems.*[30]

This is evident in the many shell middens[31] that have been discovered along our shoreline from the Orange River to Maputoland.

I wish to draw an analogy here between Banham's fire myth and the interaction between the strandloper and the beach. The beach, like the fire, defines

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[29] Parkington, 19

[30] Parkington, 10

[31] Collections of food and toolmaking debris

space in a gradated manner. It is in constant flux, unpredictable, regenerative. Whereas the fire offers up warmth and light and does so in a capricious manner, the beach, or intertidal zone, offers up food and material, and does so both unpredictably but simultaneously according to an underlying cycle. The shoreline cannot be read as homogenous. In order to understand the space of the shoreline one needs to read it against time–based phenomena: storms, tides, erosion.

This page. Growth of Table Bay Harbour since 1786. Source: Range Action in Table Bay Harbour, Cape Town, by Basil Wilson

Heterogeneous Space

The concept of space is fundamental to modernist architecture but has, in the last forty odd years, been superseded in topicality by concepts of programme and form.[32] Due to innovations in computer modelling it was hoped that a new discourse on space would emerge. This, however, hasn't developed as much as advancements in digital form–making. We see a propensity toward double–curved, tectonically complex surface architecture where the interior space remains cave–like, waiting to be filled up with whatever programme is necessary.[33]

A welcome by–product of this emphasis on geometrically complex form has been an advanced investigation into material properties and effects. An emphasis now emerges on the 'performative qualities of materials'.[34] This is important as it now allows material organisation to be viewed not merely in formal terms, but rather in a way that synthesises form, structure, performance. Materiality, is now, no longer a concern after the fact, but rather integral to the conception of form. (One can argue that this has, for millennia, been a concern of making, but I refer here specifically to the possibilities opened up by computer modelling). An example of this can be

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[32] Hensel et al., *En Route*, 9
[33] Ibid, 9–10
[34] Ibid, 10

taken from Reiser and Umemoto's *Atlas of Novel Tectonics*. They present their proposal for the Alishan footbridge, where a simple plane has been modulated to form the desired bridge. Unlike other practices that concern themselves primarily with the modulation of geometry alone, Reiser and Umemoto start to wed scale, material and geometry.[35] They utilise a meshwork of rods to achieve a balance between an arch and a deck (this form was based on their original modulation of a simple planar surface). From this point the properties of the materials and the fineness of the meshwork perform an intricate and balanced dance. Too dense or too sparse a meshwork (structure) loses the poetics of the desired expression (form), whilst simultaneously altering the actual structural performance of the bridge (changing the balance between arch and deck to a different structural system). This deals with performativity of materials[36], but what of space?

Hensel et al, define heterogeneous space by looking at the term 'difference'. They argue that, rather than seeing difference as an exception to the norm in

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[35] Reiser and Umemoto, Atlas of Novel Tectonics, 68 – 73

[36] Other readings of performativity deal with the potential energies of material: lux, humidity, diffusion, and so on. For a discussion of this see Lally, "Twelve Easy Pieces for the Piano," *Architectural Design* 79 (2009): 9

some Platonic reference to an ideal form, it should be viewed as the underlying condition. Plato viewed *ideas* as being superior to *matter*[37]. The world was thus made up out of compromised and imperfect variations on a perfect theme. This way of thinking is also present in the concept of dualisms, "examples might be the traditional opposition of masculine and feminine, in which the latter is treated as a version of the first...".[38] What we see here, is the suppression of true difference. It is a way of thinking that precludes the authenticity of uniqueness, viewing any deviation merely as a bastardised version of some *normative ideal*.

Thus, Hensel continues, quoting Deleuze, to see difference not as an opposite to something but rather as a *positivity*:

> *...the problem becomes not how to account for divergences but how to think through multiplicities and how they 'happen' and are 'correlated' through other differences.*[39]

How does this definition of heterogeneity affect space? Continuing by quoting from Deleuze and Guattari's *A Thousand Platueas*, Hensel uses the

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[37] Hill, Immaterial Architecture, 39
[38] Hensel et al., *En Route*, 12
[39] Ibid, 13

example of the games of Chess and Go as a means to understand the spatial implications of heterogeneity.

In chess, hierarchically ordered pieces occupy spaces on a board that is almost neutral save a notional difference between two poles. The game progresses by moving these pieces in relation to others across the board. The pieces can utilise their fixed power based on their position relative to others, but the board remains a static field and the pieces retain their hierarchy. In Go, the pieces are all identical. The board is made up of an extendable grid. The game progresses by placing pieces strategically on the grid. The pieces gain and lose power relative to their position on the grid and in reference to other pieces. Thus the field of play becomes an amorphous, fluid and energised surface that forms areas of potential through a subjective enabling of it[40], for, as Hill reminds us, "to use a building is also to make it",[41] pointing towards the subject's potential in the definition of space.

Broadly speaking, *heterogeneous* implies "an object or system that consists of a diverse range of items or qualities, which can include differences in kind as

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[40] Ibid, 14

[41] Hill, Criticism by Design, 168

Opposite page. Olafur Eliasson's Weather Project at the Tate Modern. Source: http://www.flickr.com/photos/aderowbotham/35826864/.

well as differences in degree".[42] To understand differences in kind and in degree we can return again to Reiser + Umemoto's *Atlas of Novel Tectonics.* They too look at the games of Chess and Go and liken Classical architecture to the game of chess in that its architectural orders are fixed and have a clear identity. A column is a column just as in chess a knight is a knight with a set hierarchical structure. Reiser and Umemoto liken their work, rather, to the game of Go. As described above, in Go, the pieces are identical and they inherit their power and meaning relative to their surroundings and position.

It seems quite hard to understand exactly how heterogeneous space can be achieved in architecture. There are a number of contemporary examples that have been discussed in relation to heterogeneous space. The works of Philippe Rahm, the art insallations of Olafur Eliasson and the Blur Building of Diller + Scofidio for example.[43] All of these tend to start blurring the boundary between inside and outside through the use of climatic or atmospheric phenomena. Before looking at some of these examples, let's return once more to the subject of the interior.

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[42] Ibid, 12

[43] Rice, The Inside of Space, 192

Charles Rice explores a new consciousness of the inside that emerged in the 19th century. This was represented by the word 'interior' that, at this time, denoted both the

> ...*'artistic effect' of the inside of a room, and for how this effect could be represented in a two-dimensional image.*[44]

[44] ibid, 186

This new way of viewing the interior emerged in folios of interior decoration marking a division between the interior and the structured architectural volume that made the inside possible. Rice continues by referencing Semper's theory of the foundational four elements of architecture and stating that they were only possible due to a 19th century attitude toward the interior. Semper gives importance primarily to the woven wall as the definition of space and views the underlying structure as secondary:

> *The masonry wall was an intrusion in to the domain of the wall fitter by the mason's art, which had evolved from building terraces according to very different conditions of style...Hanging carpets remained the true wall, the visible boundaries of space. The often solid walls behind them were necessary for reasons that had nothing to do with the creation of space; they were needed for security, for supporting a load, for their permanence, and so on.*[45]

As such, Rice notes, the architectural structuring that would make space possible is divorced from the space itself. This way of thinking, according to

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[45] Semper, The Four Elements of Architecture and Other Writings, in Rice, 186

Mitchell Schwarzer, is what made the homogenous space of Modernism possible, resulting in the free-plan and unornamented shell.[46] Rice counters this by looking 'atmospherically' at some examples of Modernism: Le Corbusier's Villa Savoye and Duiker's Open Air School in Amsterdam, and classes these as instances where space takes on a literal *fullness*. This is achieved by including the exterior within the implied envelope of the building's interior through architectonic means, concluding that:

> *...such a spatial concept has significance architecturally and institutionally when there is an ability to programme open-air classrooms, rather than simply allowing the pupils to play in the open-air yard at lunchtime.*[47]

Perhaps this offers a clue as to how to invoke spatial heterogeneity in architecture. It seems that the shell-like enclosures of certain modernisms epitomised homogenous space whereas the examples above, where the exterior is brought in to the realm of the interior, speak of a different set of spatial qualities. Perhaps it is this dissolution of the object that is behind a heterogeneous spatial experience.

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[46] Rice, 189
[47] Ibid, 189

Stan Allen speaks about moving from the object to the field.[48] He speaks of the importance of things (objects, artefacts) becoming less important than the spaces between them. Here we are reminded of the board game Go where the objects' positions on the board work together with their position relative to each other to inform their potential. When referring to 'fields' he speaks both of *field conditions* – the actual reality of the site, and more generally a new way of ordering and viewing phenomena. He gives the example of iron filings on a plate moving to conform to a magnetic field placed below it. The iron filings aren't the field they merely register the patterns of it – they make it visible.

He speaks also of architectural devices, asking not what something *is*, but rather, what it *does*. He places importance on accumulation and uses examples of buildings that have successfully grown incrementally over time (such as the Great Mosque at Cordoba) as support for his argument of the importance of local connections and parts beyond the ornamentation of the object as a whole.

What I feel is of importance here is his connection between the conceiving of something and the reality of it within site conditions, and how these two

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[48] Allen, From Object to Field, 24–31

phenomena are not distinct but rather work together in an unpredictable manner. Architecture is not a discrete object but rather an accumulation of processes that are as much informed by a priori *conceptions* as it is by the *field conditions* in which it is made.

Dissolution

Both pages: Interior view, Blur (Diller + Scofidio), Expo 2002, Yverdon-les-Bains, Switzerland. Source:, AA Files 54, page 28 - 29 (photos Diller + Scofidio). .

An example of an architecture that seeks to confront the object–obsessed formalism that has permeated the profession recently, is Diller + Scofidio's Blur building. In an interview in 2007, Elizabeth Diller spoke about their desire to challenge the visually–biased image–based architecture so prevalent in the profession today.[49] Their answer is a pavilion where the surface literally dissolves away. This pavilion seemingly involves neither interior nor exterior space as these boundaries are forever shifting. This shifting boundary can also disappear completely when the building is 'switched off'. This begs the question 'is this still a building, when it provides no shelter, and has no inside?' If we look again at Semper's thoughts on space we find an answer,

> *Hanging carpets remained the true wall, the visible boundaries of space. The often solid walls behind them were necessary for reasons that had nothing to do with the creation of space.*[50]

We find this reiterated by Vittoria Di Palma when she states:

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[49] Diller, Elizabeth. Architecture is a special effects machine

[50] Semper, 186

> *Although Blur's absolute ephemerality seems to challenge one of the fundamental defining characteristics of architecture – its constructedness, or the Vitruvian quality of* firmitas *– the appearance of the cloud was in fact entirely dependent on the pavilion's structure. Blur's cloud could not have existed without the steel network out of which it emerged and which made the experience of visiting it possible.*[51]

So, looking at this project, we find that it exists not in volume, nor in defined space but in effect and for it to be understood it needs to be experienced.[52]

This brings us back to both Allen's questioning of the object and the importance he places on what something *does* as opposed to what it *is*, and Banham's heterogeneous space of the campfire.

Another interesting issue dealt with in the Blur building, and one that has become important in my design direction, is that of its attitude toward the landscape. The Blur building is literally made of its landscape. The water of Lake Neuchâtel, in which the building sits, is sucked up by pumps and sprayed

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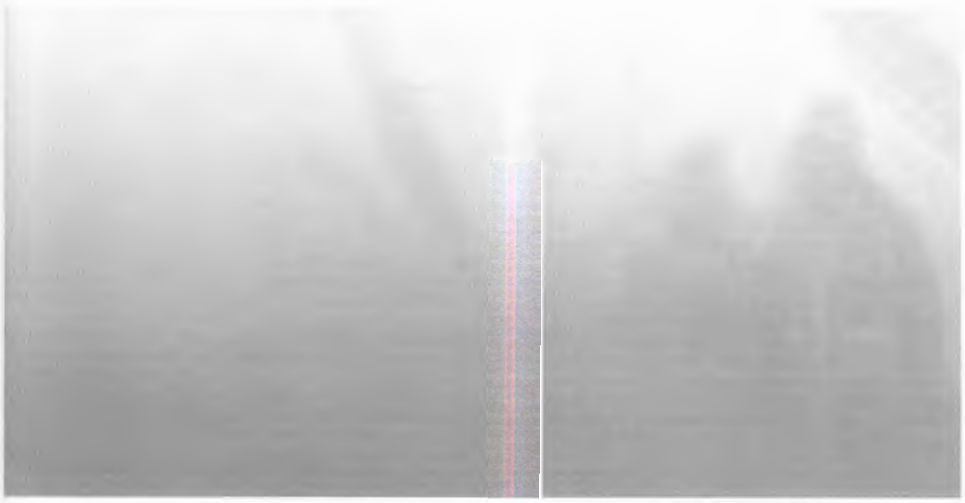
[51] Di Palma, "Blurs, Blots and Clouds," *AA Files* 54 (2006): 28

[52] Di Palma, 28



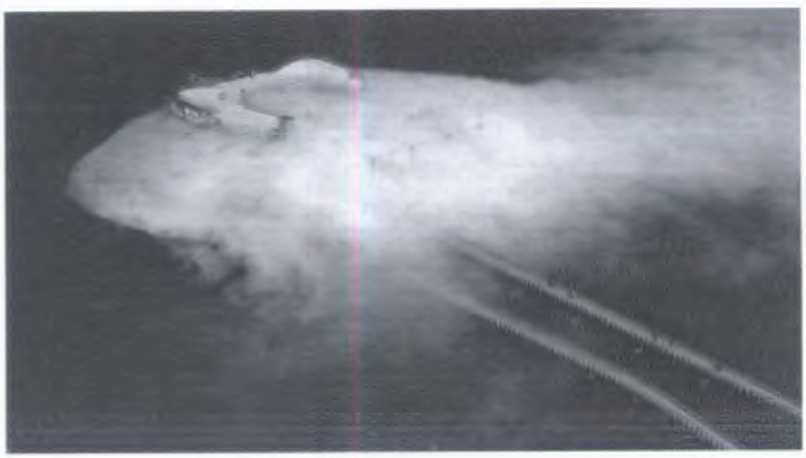
into a fine mist via 30 000 agricultural water nozzles creating the atmospheric effect that is the Blur building. If we look again at Colomina's observation...

> *The house is a device to see the world, a mechanism for viewing. Shelter, separation from the outside, is provided by the window's ability to turn the threatening world into a reassuring picture.*

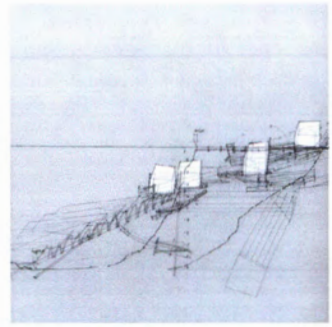
...we can see that the outside is no longer viewed from a discrete distance, it is brought right in to the fabric of architecture, forcing us to reassess the way we view and experience the landscape.

This attitude is reminiscent of the picturesque, but engages with it in a more critical dimension by positioning the subject in the midst of that which is being perceived and opening up the possibility for the processes and systems underlying the object of contemplation to be viewed in different ways.

The work of Mark Smout and Laura Allen, particularly their Retreating Village, is indicative of this approach, where the interaction between man and environment is dealt with in sensitive and complimentary ways. Situated on the coast of North Norfolk, the village of Happisburgh is slowly falling into the sea. The fragile coastline is being attacked by wave action and rising



This page top: home-testing of interaction between LED light and fog. Source: Blur: The Making of Nothing, pages 244-245
This page, bottom: Aerial view, Blur. Source: AA Files 54, page 28 - 29 (photos Diller + Scofidio).



This page right. Houses on the move, illustration by Mark Smout. Source: http://pruned.blogspot.comThis page left. Retreating Village, Happisburgh, illustration Smout Allen. Source: http://www.smoutallen.com/

sea levels. The houses periodically succumb to the disintegration of the cliff and topple into the sea below.

Smout + Allen's response is to make a village that shifts and slides in response to the coast.[53] Houses are attached to rails that allow them free movement. When the edge of the cliff becomes catastrophically close, the occupants of the houses move them to safety.

This technique employs pulleys, winches and ropes reminiscent of the gear used to haul fishing boats onto dry land. What is interesting about this condition is the interaction between building and landscape. Neither is fixed, both are shifting. The houses give up the land they once occupied to satisfy the sea's appetite allowing its material to be transformed into beach until a delicate equilibrium is achieved between wave action and cliff. This response acknowledges the primacy of the landscape, bringing it in to the experience of the house. The landscape is treated, not as something to be tamed, but rather as something to be negotiated.

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[53] Smout and Allen, Pamphlet Architecture 28: *Augmented Landscapes,* 55 – 62

Conclusion

By concluding I would like to return, once again, to the intertidal zone along the shores of Table Bay. This will be the site for my intervention. ~~Positioned just north of the man-made harbour, the site is an interesting juxtaposition of natural and manufactured elements. A sandy beach, rare in this area, is bordered by huge dolosse to the east, and the ebb and flow of the ocean to the west. A canalised river, the Salt River Canal, borders it to the north whilst the Ben Schoeman container terminal ends its axis in the south.~~

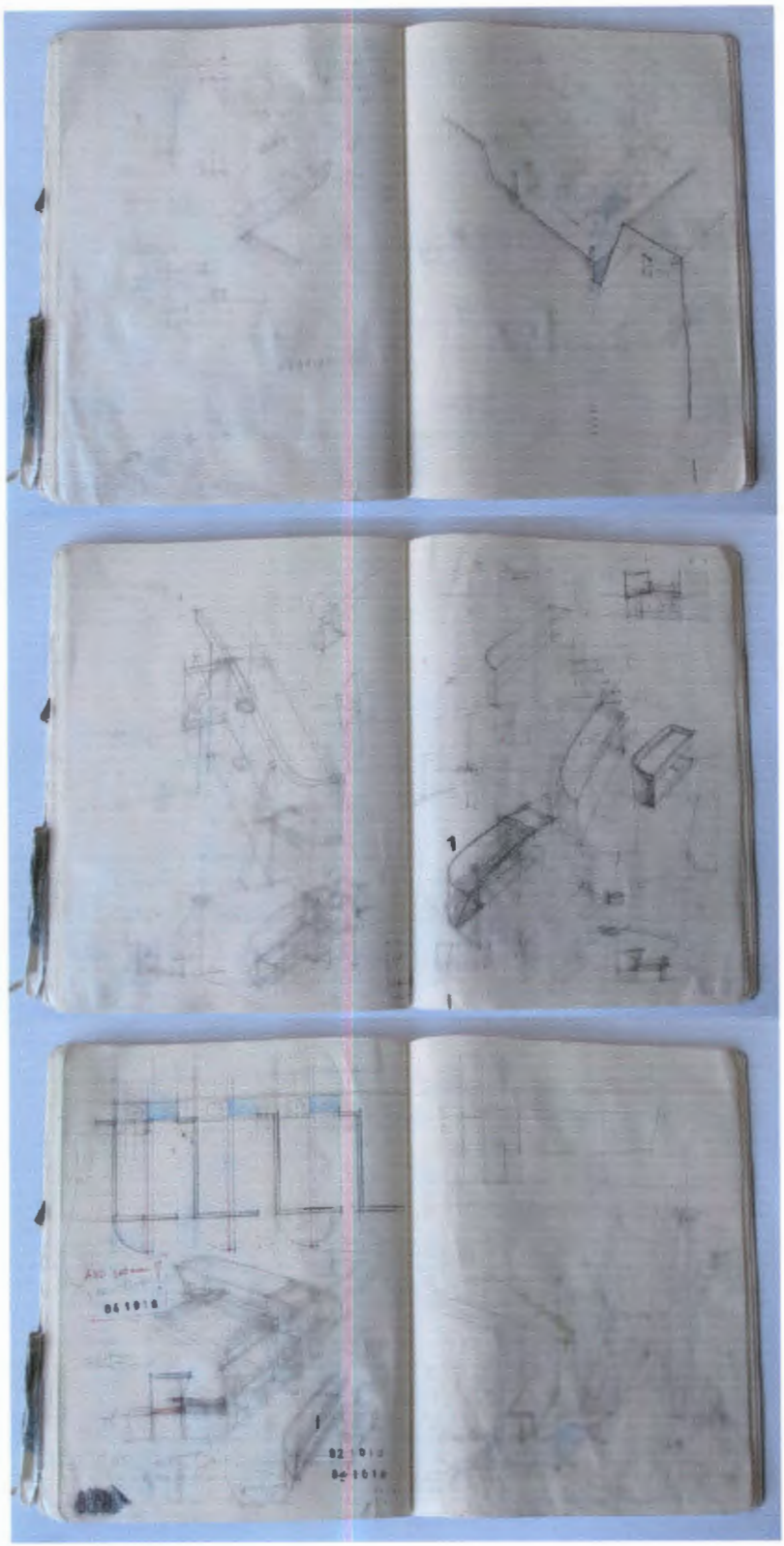
Positioned along, and protected by, the main breakwater at Cape Town Harbour, the site is completely composed of reclaimed land. It straddles the boundary between the old breakwater completed circa 1875, the East Pier, completed circa 1895 and the breakwater extension, completed circa 1931.

By invoking the weather and bringing it within the fabric of architecture I wish to explore notions of heterogeneous space in this intervention by blurring the boundaries of object and landscape and exploring how the building, as device, can open up new readings of how we view *environment*.

Storm Warning: a theatre of atmospherics

Notebook Images

Images from my notebook that have served to inform my design direction, particularly the development of the *spatial dolos*.

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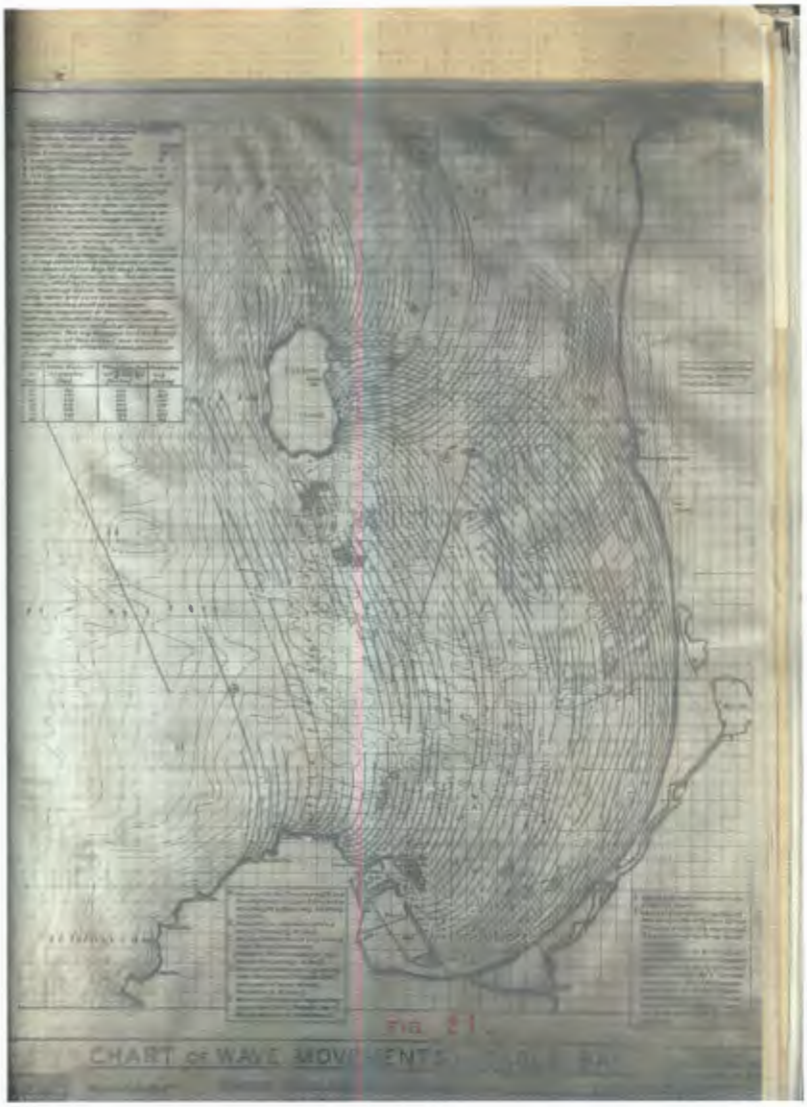
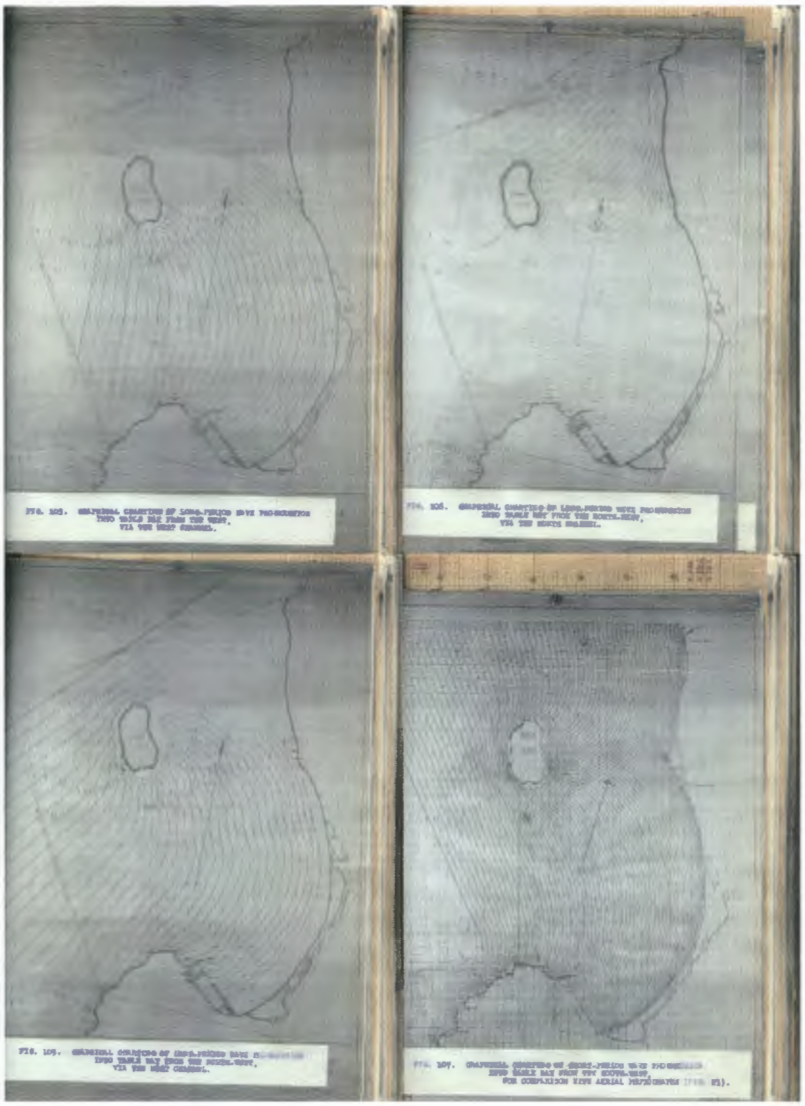
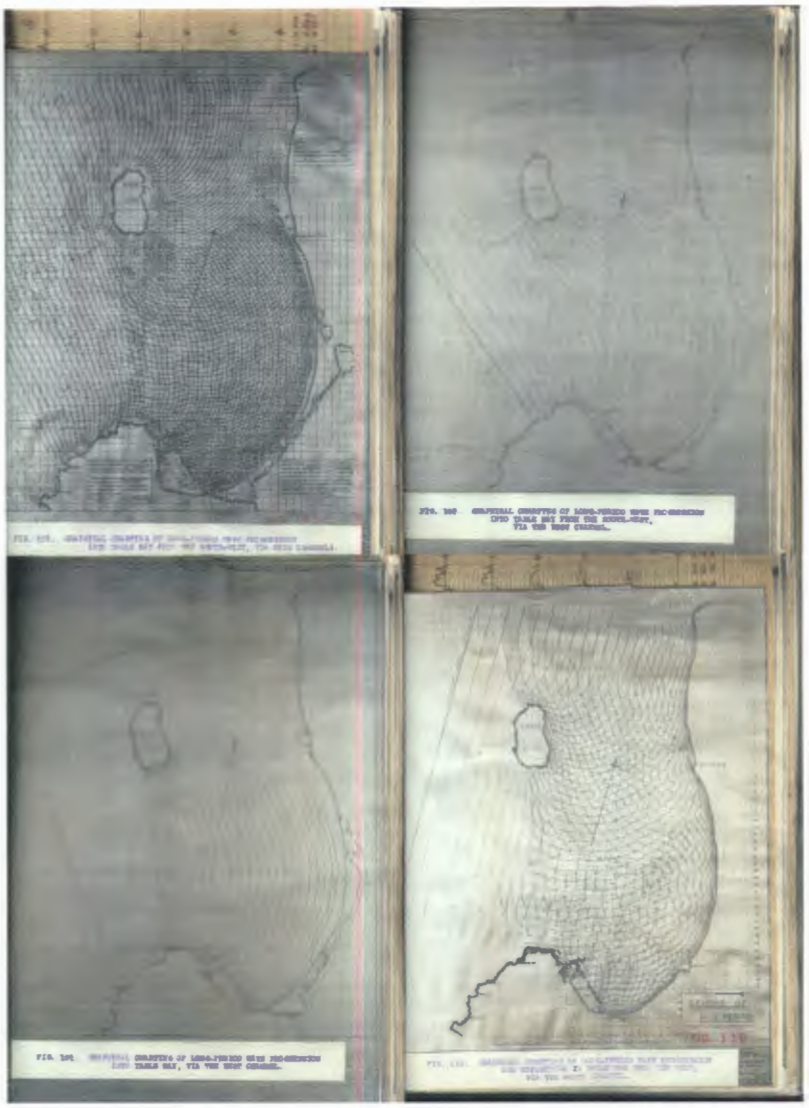


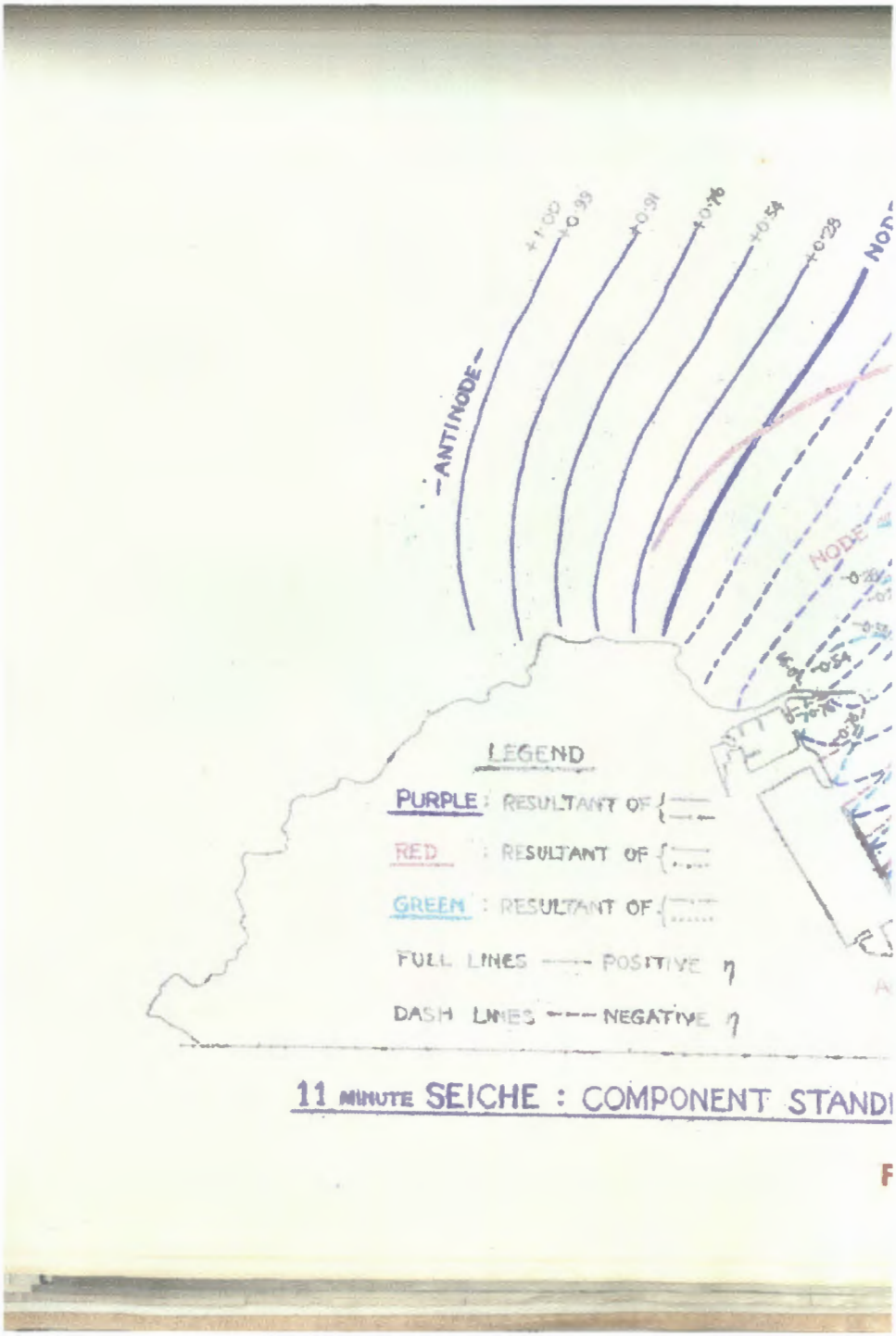
Charts, Graphs, Instruments...

the following images are mostly taken from a fantastic PhD document on range action in Table Bay written in 1951 by the scientist Basil Wilson. Although the information presented therein has most likely changed due to the expansion of the docks (Ben Schoeman container terminal) the images and avenues of inquiry this document has opened up have been most inspiring and interesting





charts of wave progression into Table Bay from various channels. Source: Range Action in Table Bay Harbour, Cape Town by Basil Wilson.


+1.00
+0.99
+0.91
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+0.28
ANTINODE
NODE
LEGEND
PURPLE : RESULTANT OF
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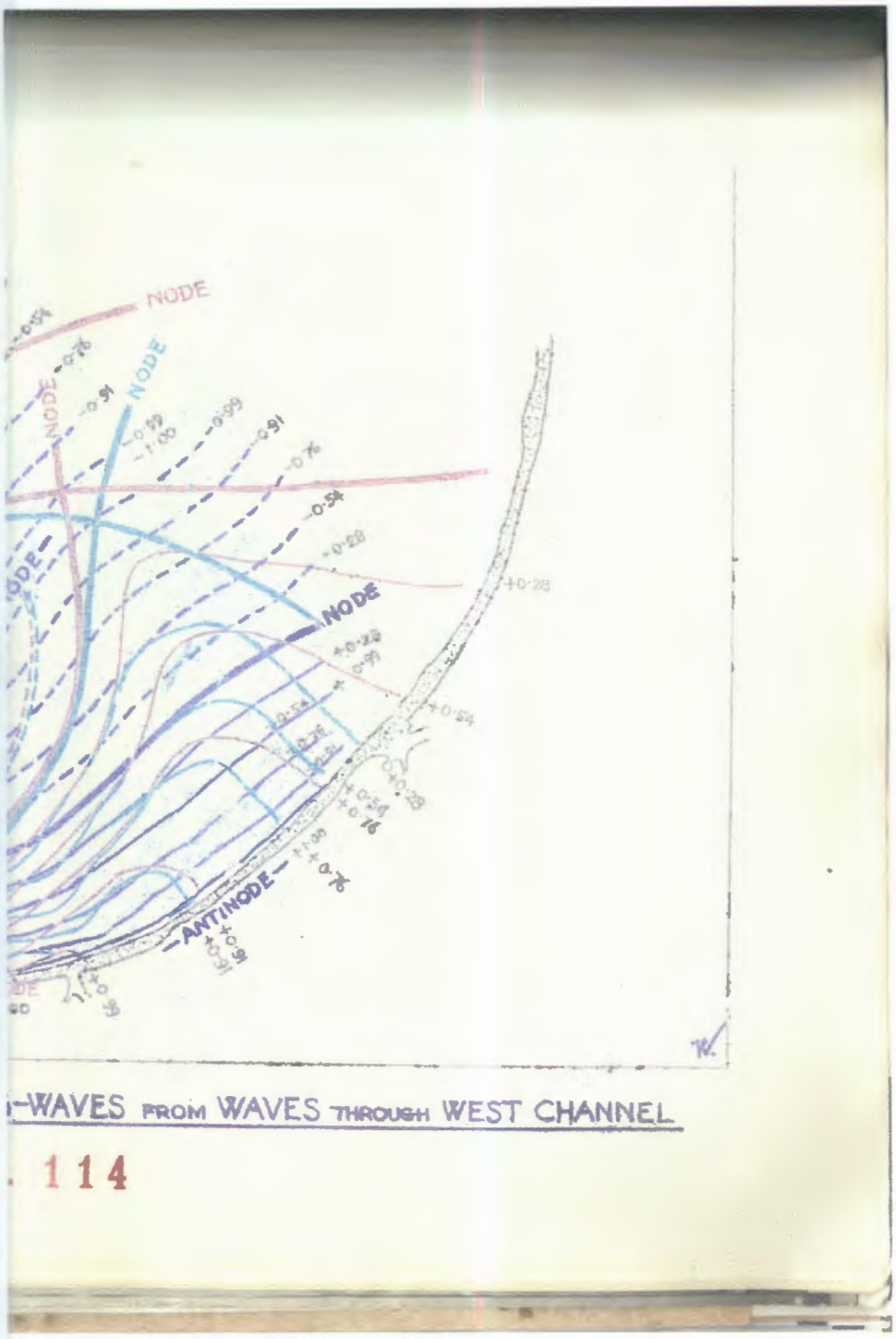
DASH LINES --- NEGATIVE η
11 MINUTE SEICHE : COMPONENT STANDI



component standing waves (seiches) through West channel. Seiches usually form in bodies of water that are bounded by land masses (such as Table Bay). A seiche is a wave that undergoes no vertical movement, and are thus hard to notice. Source: Range Action in Table Bay Harbour, Cape Town, by Basil Wilson

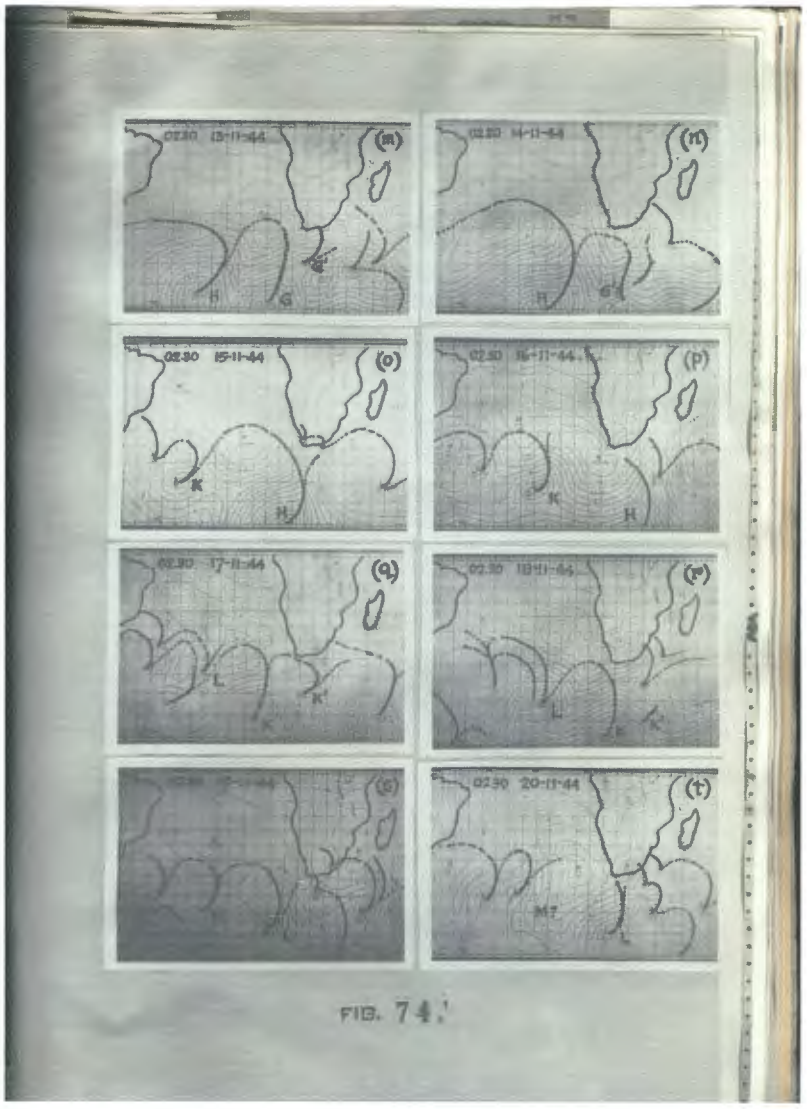

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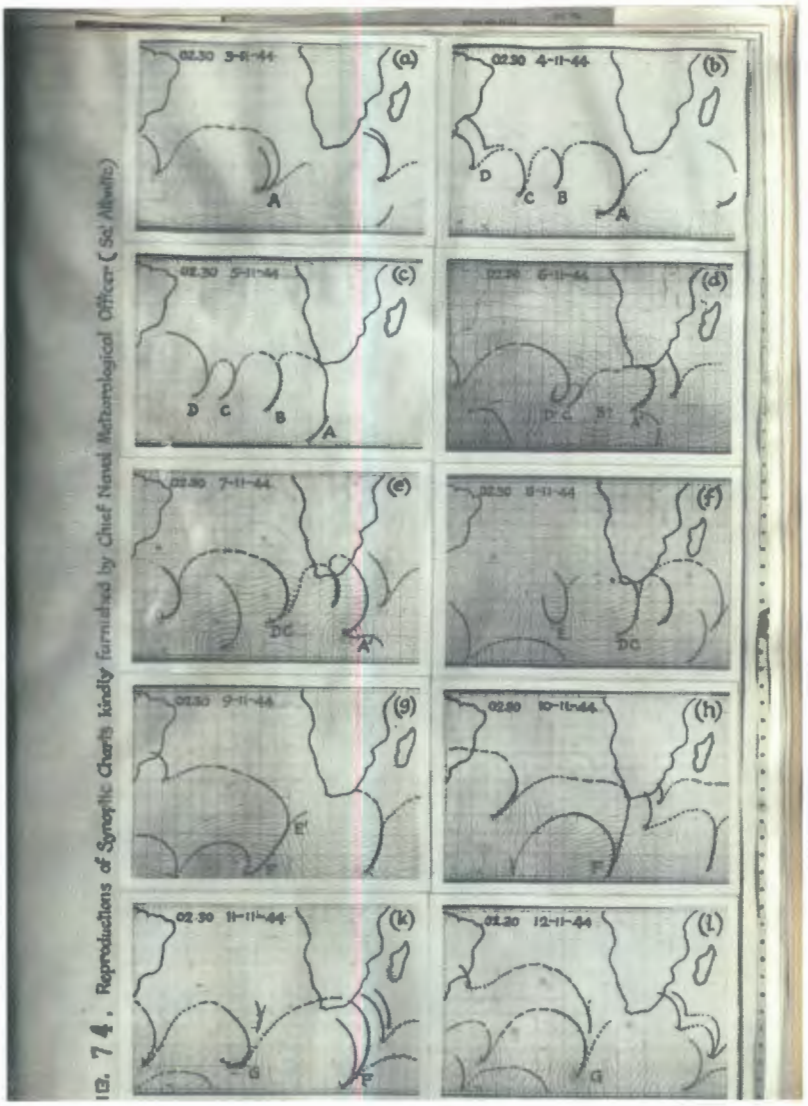
FIG. 74.



synoptic charts for the year 1944. Source: Range Action in Table Bay Harbour, Cape Town, by Basil Wilson

Where?

Opposite page: The Schooner Olivia, by Thomas Baines. Source: (William Fehr Collection, Iziko Museums of Cape Town) in Hoerikwaggo: Images of Table Mountain, pg. 73.

When speaking of the *Cape of Storms*, images of Table Bay with Table Mountain as a backdrop generally spring to mind. This epithet conjures up nautical references, shipwrecks, ragged coastlines, stormy seas. As such, it seemed appropriate that my project be located in a windswept, coastal area.

After initial investigations in the Duncan Docks proved that, firstly, access to this area is extremely difficult[54], secondly, it is strangely rather protected from south–easterly gales due to the sheltering of Devil's Peak, and thirdly, actual access to the water is almost illegal, it seemed best to locate my project somewhere more accessible – but at the same time, more hostile.

Rather serendipitously, the property manager of the National Ports Authority suggested I use a site just north of the Ben Schoeman Container Terminal. According to him it is 'windy there all the time', and he would be able to give me access to the site until March 2011. I agreed. This area then became my site. After repeated site visits and weeks agonizing over programme, I decided that the site would have to be changed. The nature of the site suggested that an intervention would be more a hindrance than a

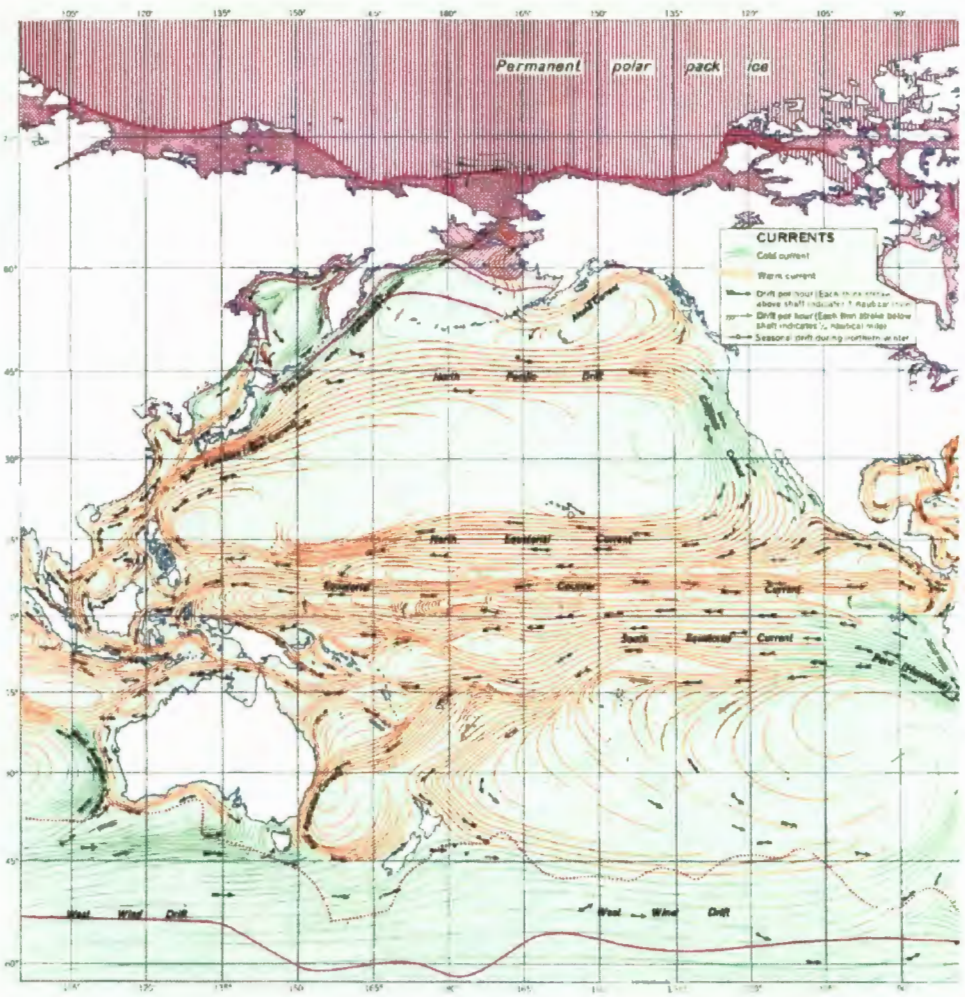
[54] Permits are required whenever you visit making site visits very difficult

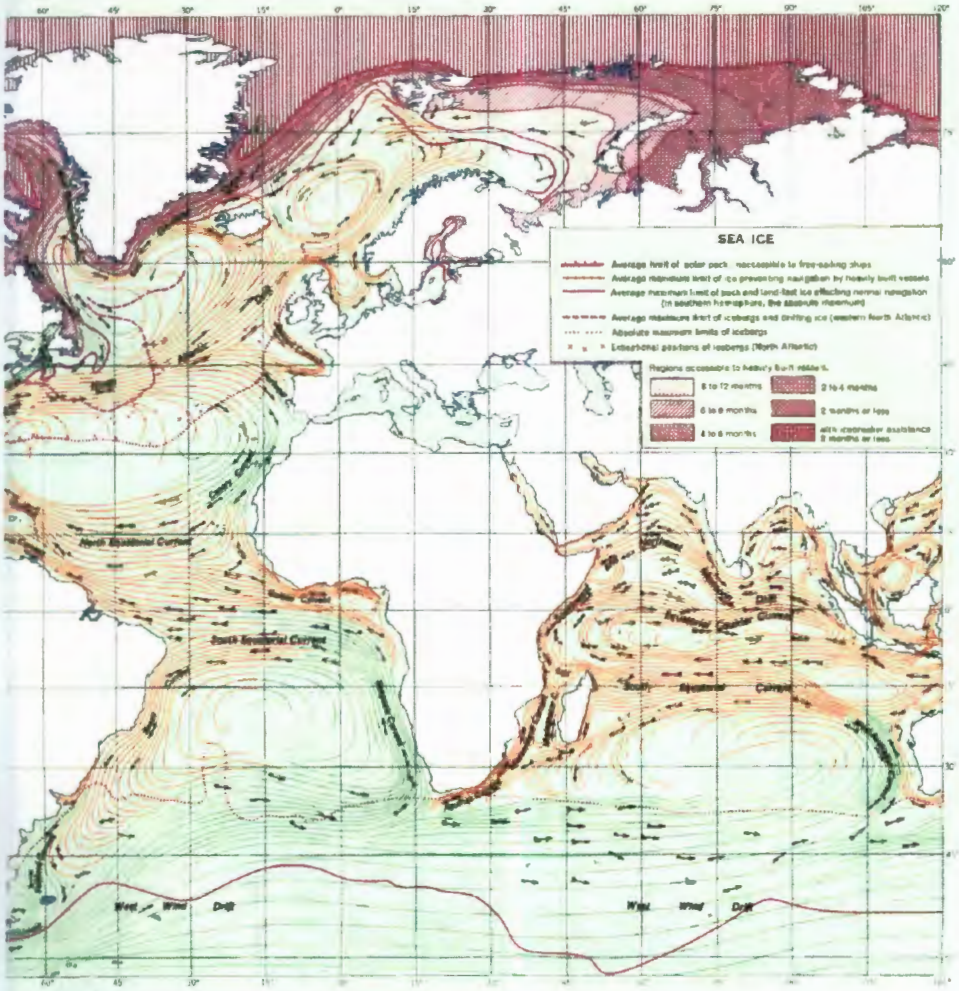
help. I needed a site that epitomised the Cape of Storms and could accommodate an appropriate architecture.

After more wanderings around Table Bay I eventually decided upon the main breakwater at Cape Town Harbour. This is the last line of defence between Table Bay and the Atlantic Ocean beyond and, as such, seemed perfect.

After initial site research it was revealed that this area belongs partially to the Waterfront (area behind the breakwater) and partially to Transnet National Ports Authority (the breakwater itself). The South African National Antarctic Programme (SANAP) headquarters were also located nearby. These facts started to form the basis of my programme.

Site at various scales (global)

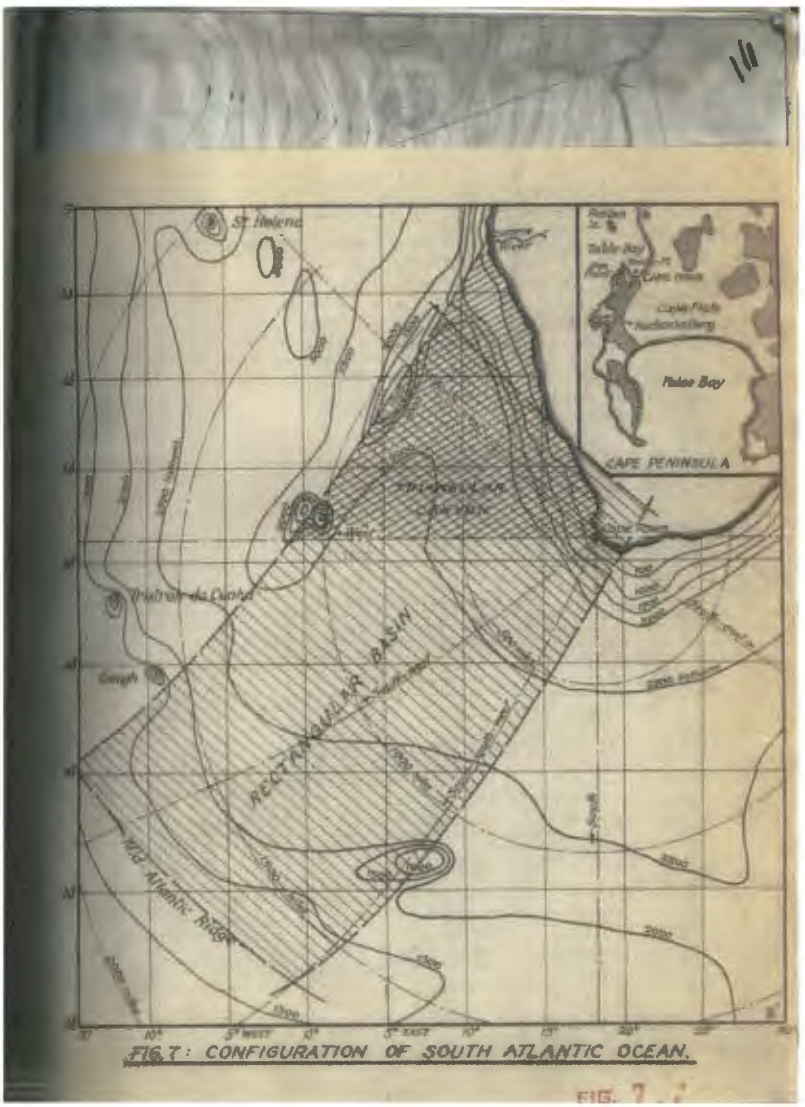


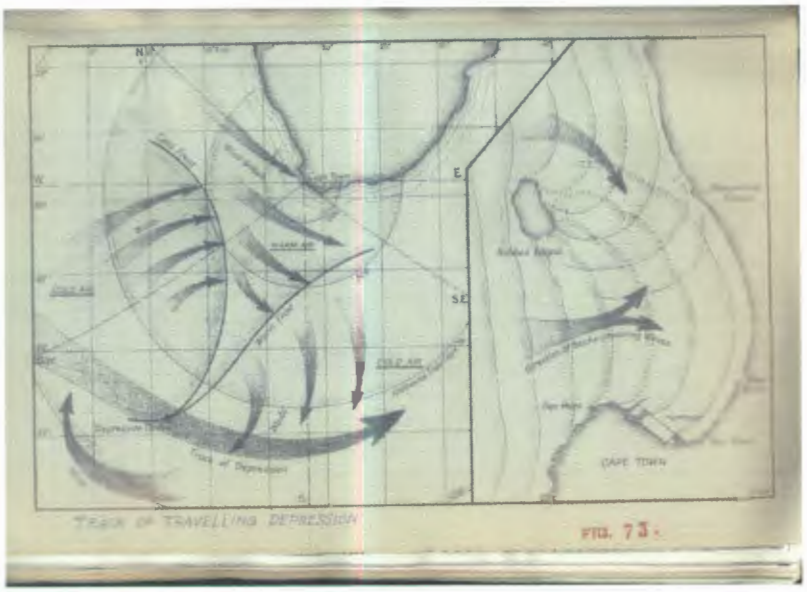


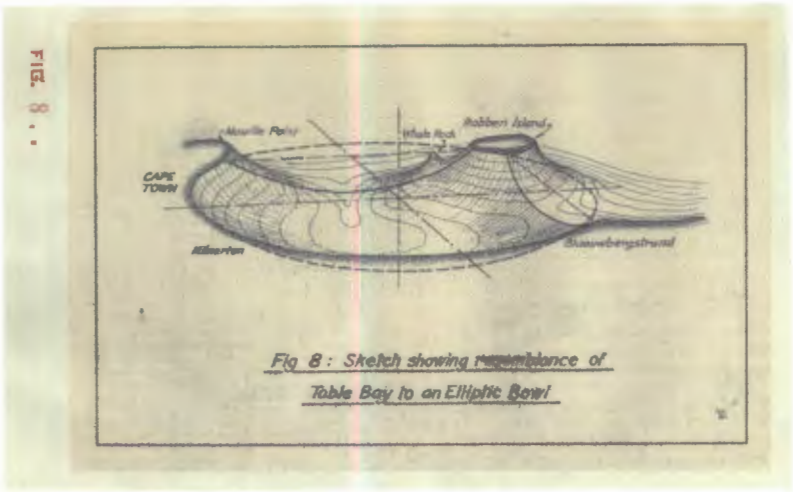
one of the cycles of interest to this project is that of ocean currents. These currents effectively connect all the world's oceans as one. They are responsible for mediating the world's climate and, as such, variations in one area can have a profound effect on the weather in other areas. Due to this project's connection to SANAP it is worth mentioning the effect that Antarctica has on the earth's climate. Known as the *weather machine* the Antarctic and its protection is fundamental to the well being of the earth's climate. The research SANAP undertakes, both in Cape Town and at its base in Antarctica is of vital importance in this regard.

Image at left, Ocean Currents 1943. Source: http://en.wikipedia.org/wiki/Ocean_current

(Atlantic)


St. Helena
Table Bay
Cape Town
Cape Point
Simon's Town
False Bay
CAPE PENINSULA
RECTANGULAR BASIN
Mid Atlantic Ridge
10° WEST
5° WEST
0°
5° EAST
10°
15°
20°
25°
FIG. 7 : CONFIGURATION OF SOUTH ATLANTIC OCEAN.
FIG. 7

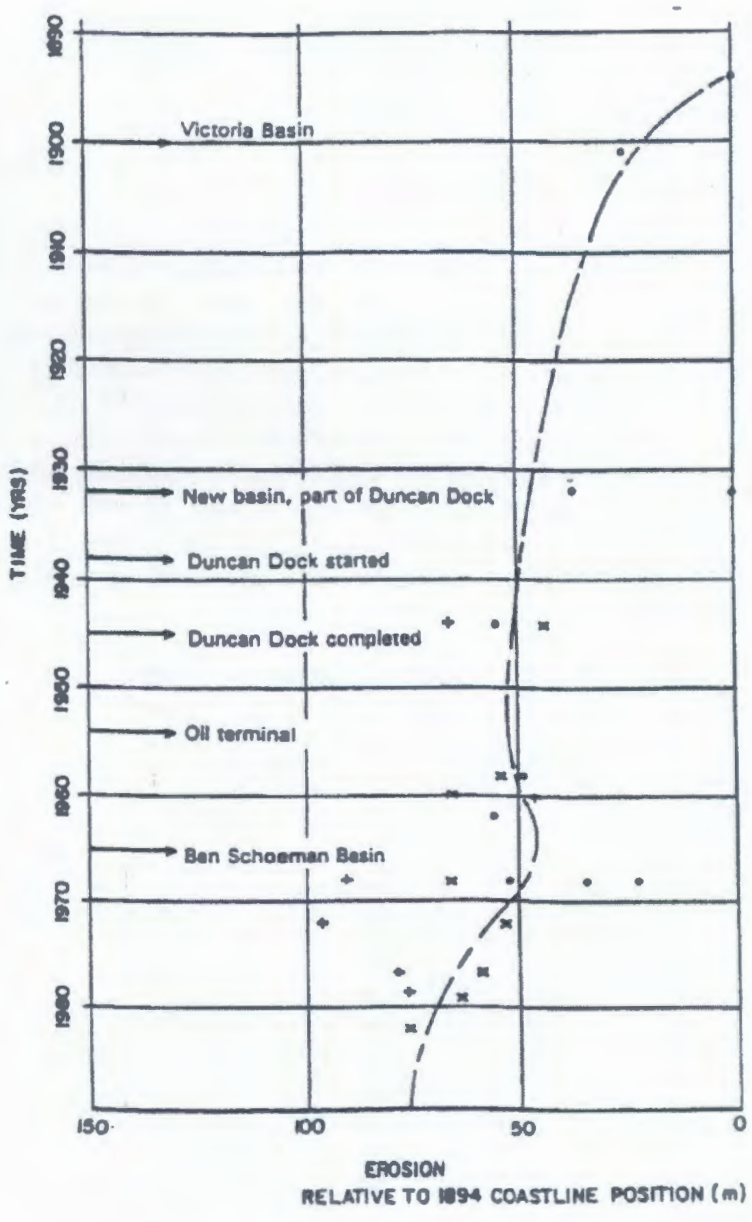


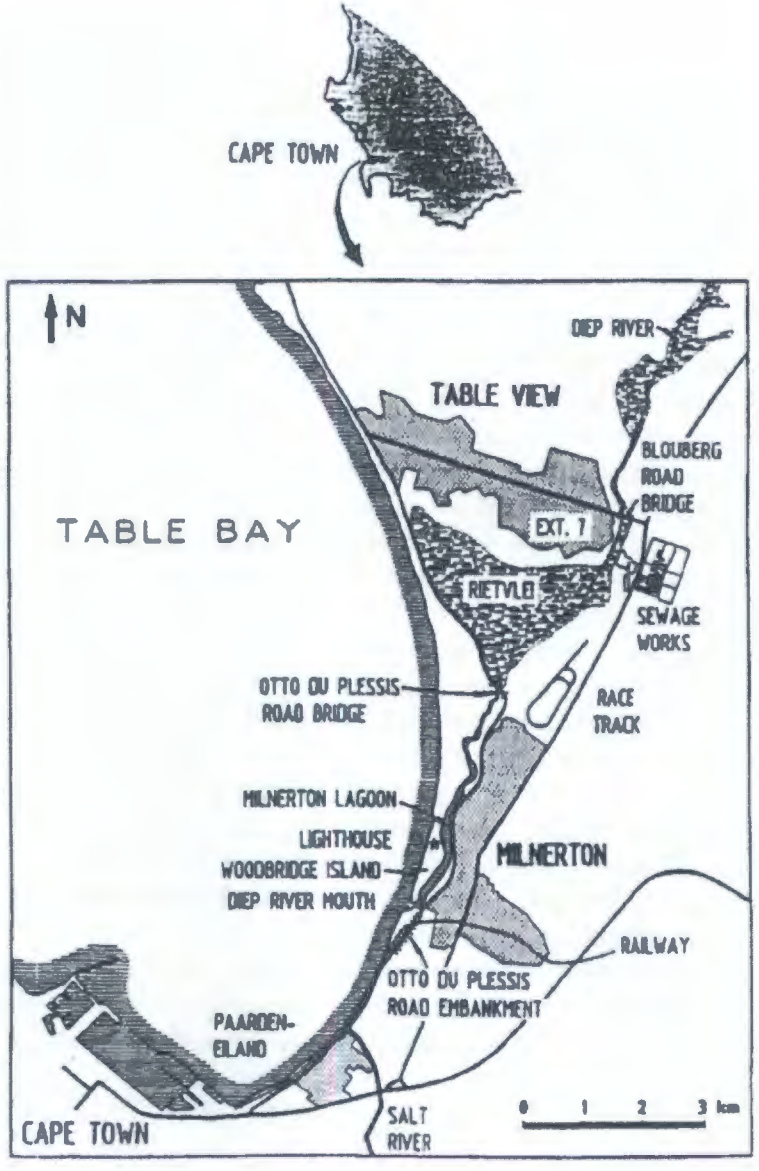


(Table Bay)

the shape of Table Bay has been formed over millenia. It takes the form of an elliptical bowl. Waves and currents (the general motion of water) generally enter Table Bay from the western passage (channel between Greenpoint and Robben Island) and leave via the north passage (channel between Robben Island and Melkbosstrand). Due to the foreshore reclamation (of which the breakwater can be considered a part) the natural shape of Table Bay has been altered. The natural equilibrium wants to be restored and the large-scale changes to Cape Town harbour have been blamed for the current erosion of the Milnerton coast.
Images: (all images sourced from Research and Model Studies on Range Action in Table Bay Harbour, Cape Town by Basil Wilson). Opposite page, Configuration of South Atlantic Ocean. This page top, Track of Travelling Depression. This page, bottom, Sketch showing resemblance of Table Bay to an Elliptical Bowl

(Table Bay continued...)

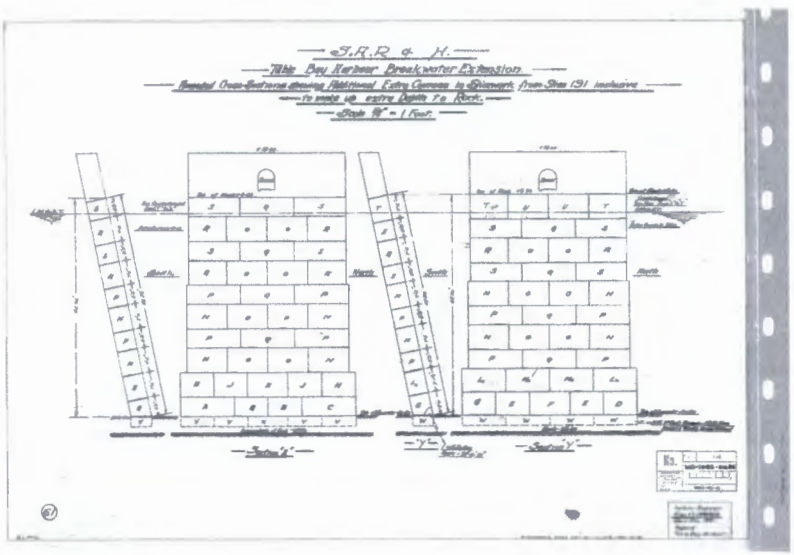




The relationship between the harbour works and the Milnerton coast. This page, Location Map. Opposite page, Historical Shoreline Changes. Source (both images): The Possible Impacts of Sea-Level Rise on the Diep River/ Rietvlei system, Cape Town, pg. 489.

(Breakwater)

This page, top. An aerial photograph of Table Bay with my site circled in pink. Source: The Department of Surveys and Mappings, Rosebank.
Bottom. A cross-section through the breakwater. Source: Transnet National Ports Authority.



(Breakwater continued...)

the site is protected by dolosse (interlocking reinforced concrete coastline protection blocks) for half its length. The other half of the breakwater is unprotected by dolosse. The waves in this area are therefore bigger and more forceful (as wave energy is relative to wave depth, which is itself relative to the depth of the water). On the image at right, the location of the weather device is indicated by the number 1., the SANAP research labs by the number 2., and the theatre by the number 3.

Image at right, Collage of site plan (furnished by the Waterfront) and photostat and pencil of site at 1:1000. Far right, site photo. Both images, Timothy Penfold

1.

Why?

This project is an attempt to capture the windy and stormy nature of Cape Town in an architectural manner.

By invoking the weather and bringing it within the fabric of architecture I wish to explore notions of heterogeneous space in this intervention by blurring the boundaries of object and landscape and exploring how the building, as device, can open up new readings of how we view *environment*.

What?

This project has evolved into the following elements (as mentioned in the preface to this document) collectively known as the Theatre of Atmospherics:

A weather device located at the end of the breakwater.

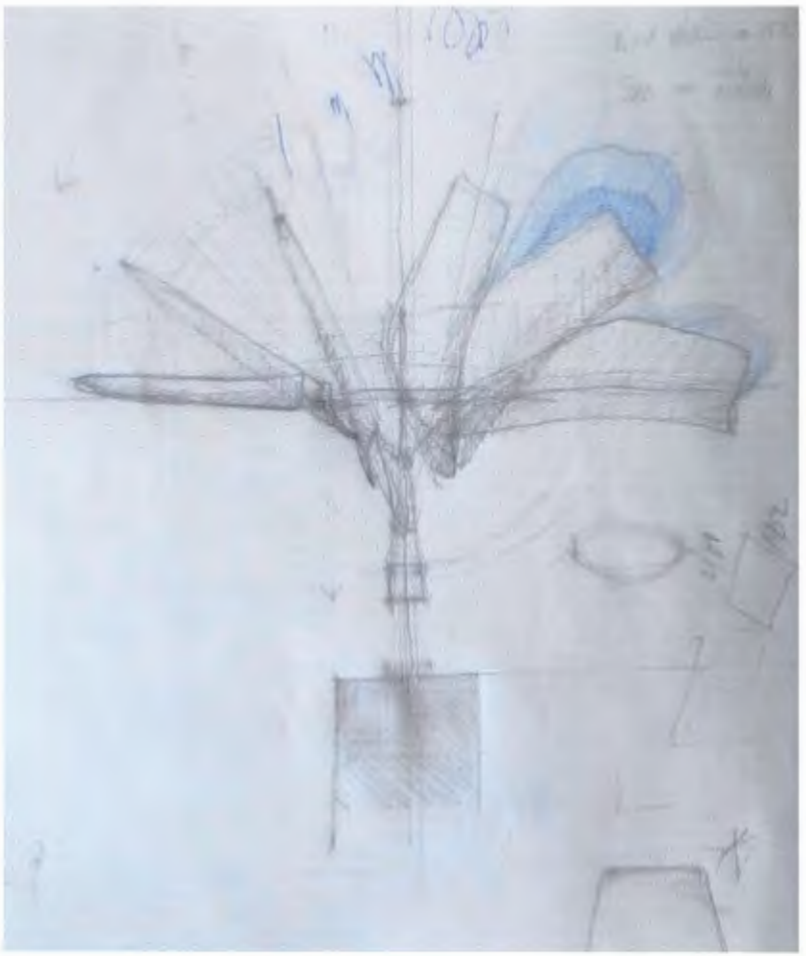
A research facility for SANAP.

A shifting communal space servicing the research facility and connected to the weather device via the theatre.

A theatre (room of machinery) serving as gateway to the breakwater and acting as registry for the weather.

What follows is precedent for each element and the beginnings of the design itself.

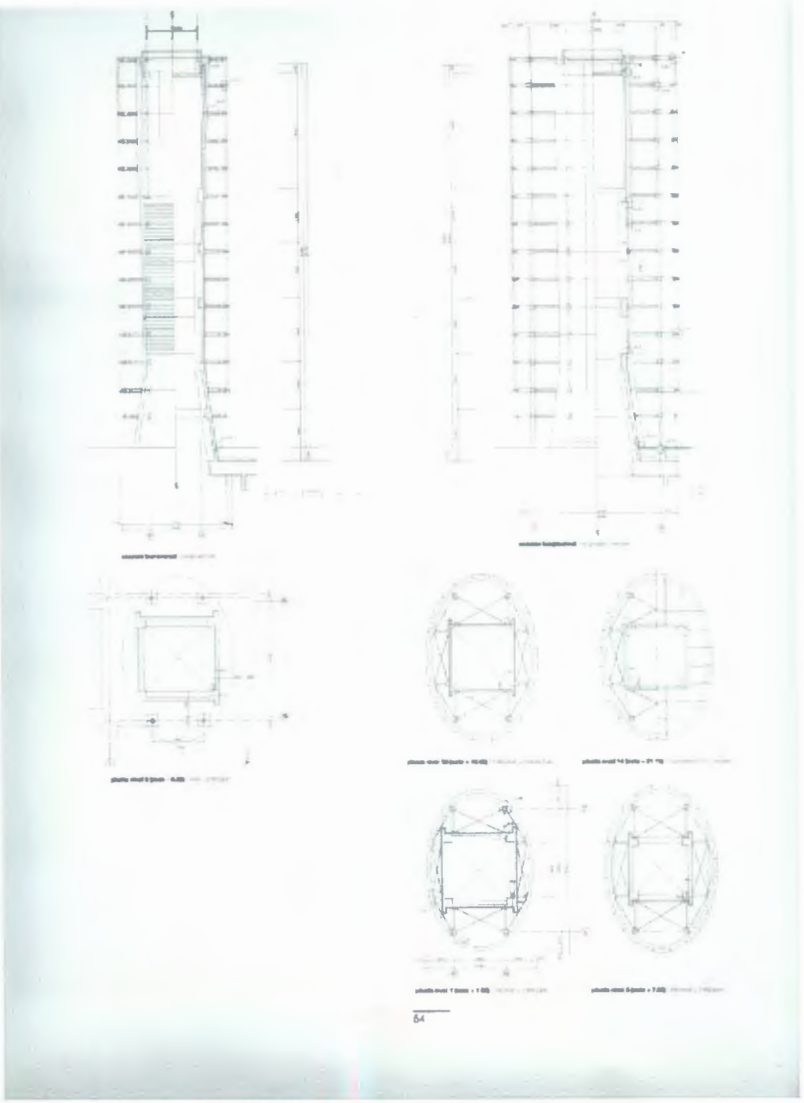
Weather device

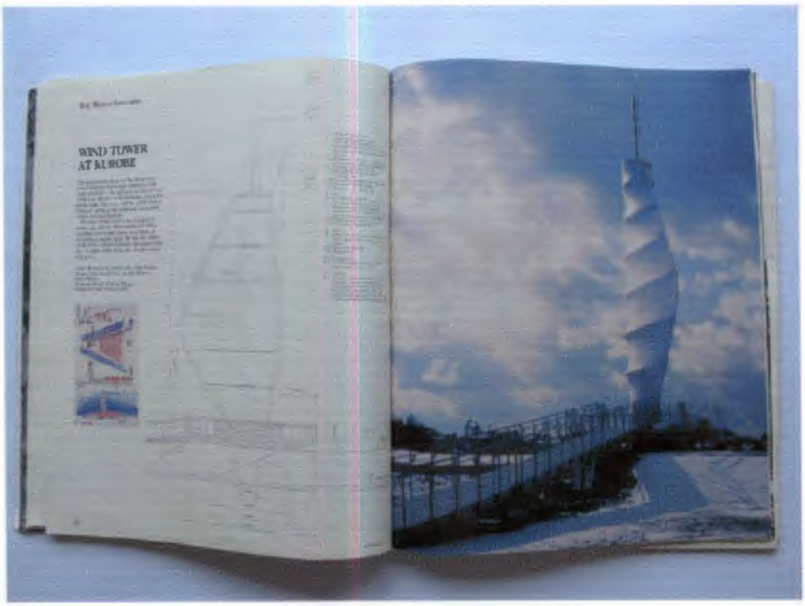


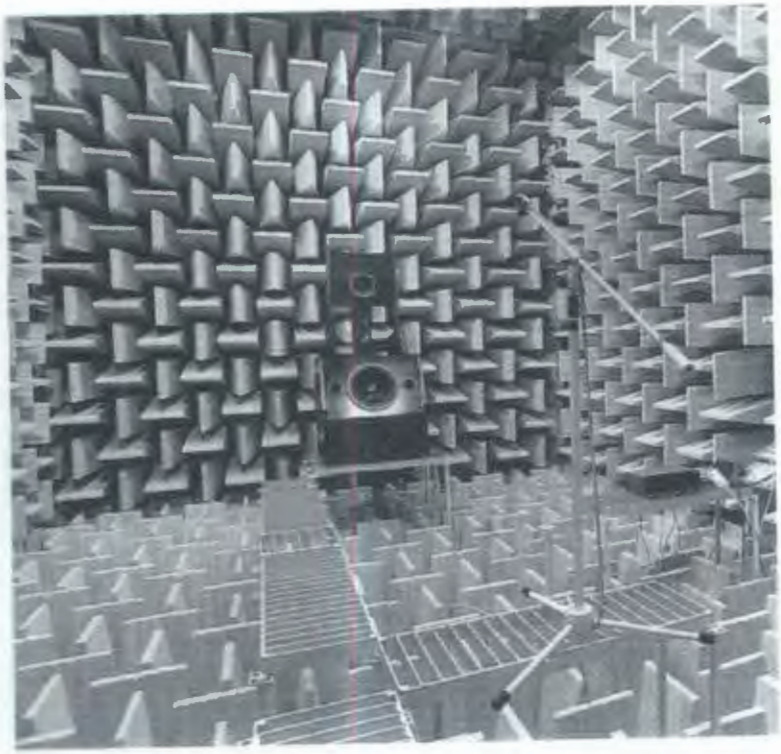
The weather device, located at the end of the breakwater will react to the wind, will register the tidal movements and foreshadow coming storms by reacting to a change in barometric pressure. The two towers I have looked at both register the wind and heighten the user's experience of it. Toyo Ito's *Tower of the Winds* uses lighting (within and at the base of the tower), mirrors, and a punctured aluminium screen to create different effects based on the direction and velocity of the wind. Ron Herron's *Wind Tower At Kurobe* uses a canvas screen pulled taught over a steel frame, lights and a reflective water pond to register the effects of the wind. Both these towers are rather simple, utilizing mostly light and reflection as means to convey the effects of the weather.

Images: Opposite page, top. Plans and sections of Ito's *Tower of the Winds*. Source: El Croquis 71 Toyo Ito, 1986-1995. Opposite page, bottom. Ron Herron's *Wind Tower at Kurobe*. Source: AA Files 25, pgs. 52-53.

This page. *Weather device* on the breakwater - concept sketch. Timothy Penfold




WIND TOWER
AT AUROBE



Research Labs

The research labs have been chosen due to the need for a centralised Antarctic research location in Cape Town and the site's proximity to the current SANAP headquarters. The Polar Foundation is proposing a similar facility and have designed one for Brussels. This facility serves as a means to educate the public on the fragility of the Polar regions and the effects of climate change. Their design is a prototype and is intended to be able to be reproduced for different locations around the world including Cape Town

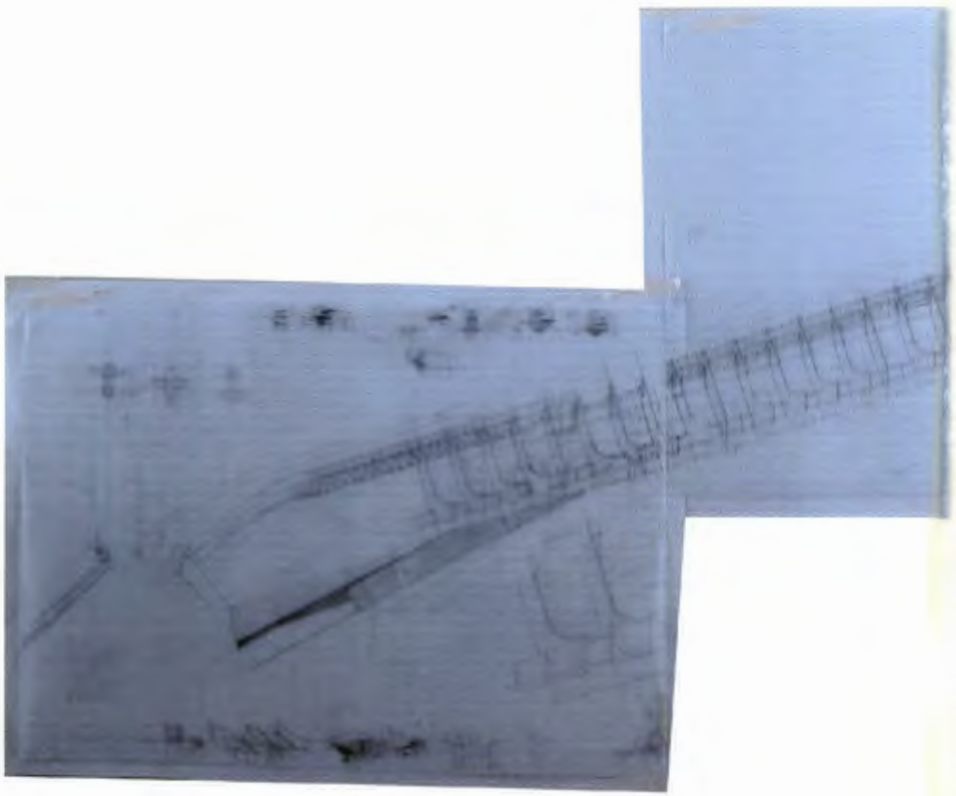
The research facility I propose will house the South African National Antarctic Programme's research community. It will include labs, office space, meeting and conference venues, a visitor information space and various service areas. There currently isn't such a facility available and the various research field's headquarters are located in different spaces around South Africa.

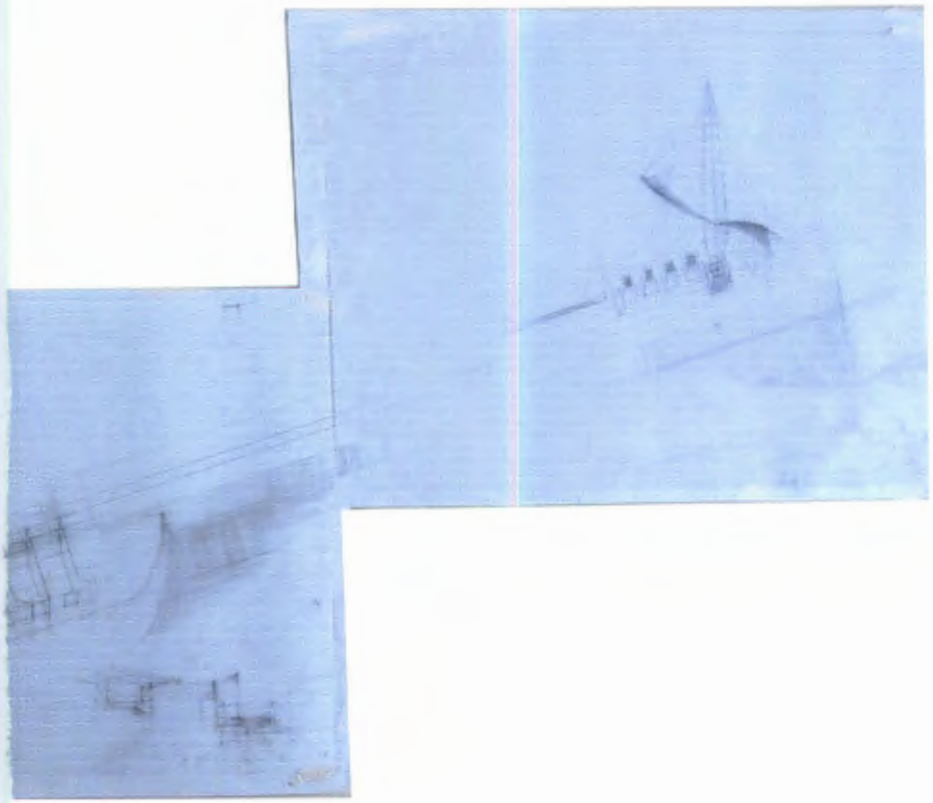
Images:
This page, top. Renzo Piano's Institute of Research and Co-ordination into Acoustics and Music (IRCAM). Highly sound absorbent room. Middle. Main room prepared for a performance (the main space is adjustable in volume and layout). Bottom. Cross-section through the IRCAM labs. The spatial layout is rather homogenous, the spaces themselves are highly adaptable. Source: Renzo Piano Building Workshop Complete Works Volume 1, pgs. 205-206.

The Department of Agriculture, Forestry and Fisheries' Research Aquarium in Seapoint.
This building has been converted into a research facility. It is similar to my site being long and thin. It has large, double volumes that are made use of frequently. It has almost no interaction with the street. The windows have been shuttered. The office spaces inside are dark and hardly adequate.
Images property of the author.
Opposite page. The Biovac Institute in Pinelands by studioMAS is a rather celebrated research facility. It has research spaces on the first floor separated from an open plan office by an internal 'street'. The open-plan office then opens onto separate offices composed along the front facade. The parking on the ground floor has been given enough headroom in order to be able to be transformed into research spaces if needs be.
The research space itself is one large volume that has been divided off into separate specialist areas. Images courtesy studioMAS

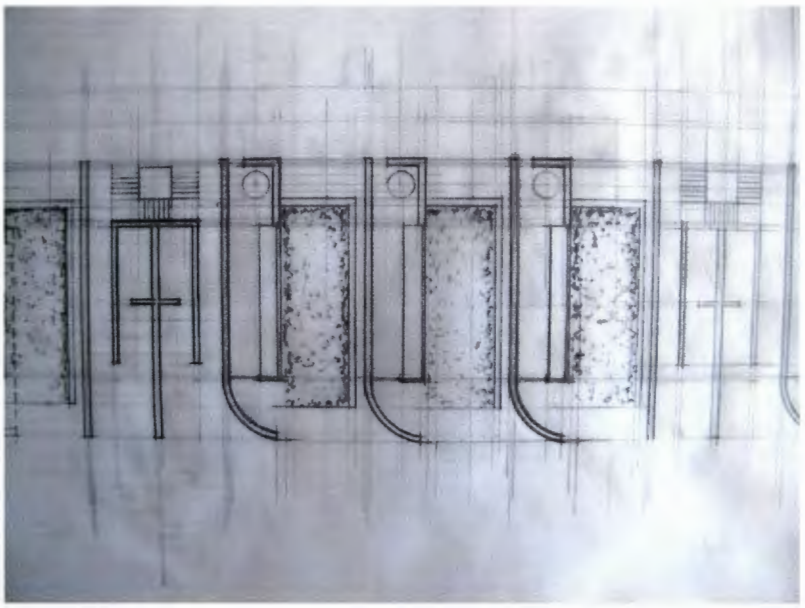
First floor plan and long section through the Biovac Institute, Pinelands by studioMAS. Images courtesy studioMAS.

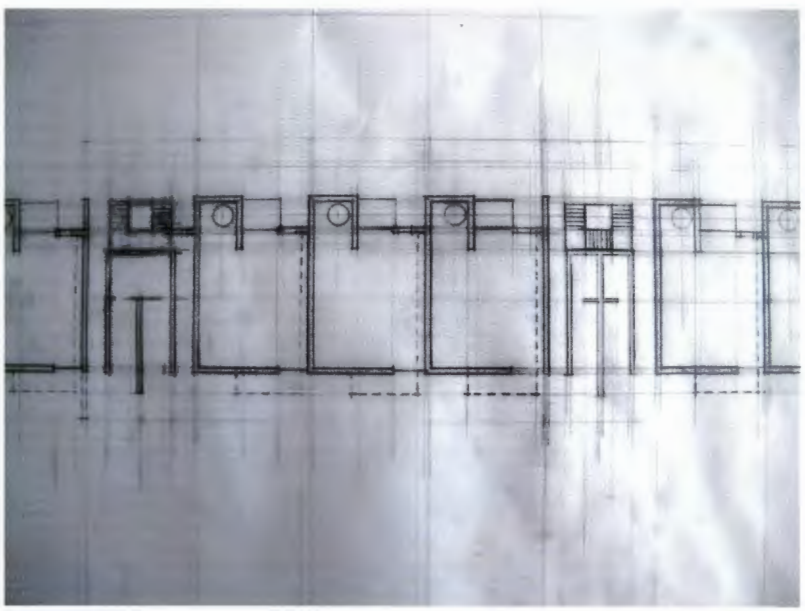
Initial axonometric projeciton of intended research/ office space. the design has been subsequently altered but the basic layout and premise remains.
A repeated concrete element I have named the *Spatial Dolos* (to be discussed later) forms the research labs and office spaces. The weather device can be seen at the end of the breakwater whilst the visitor centre and conference rooms are located at the other end of the axis. The theatre space is still to be represented.

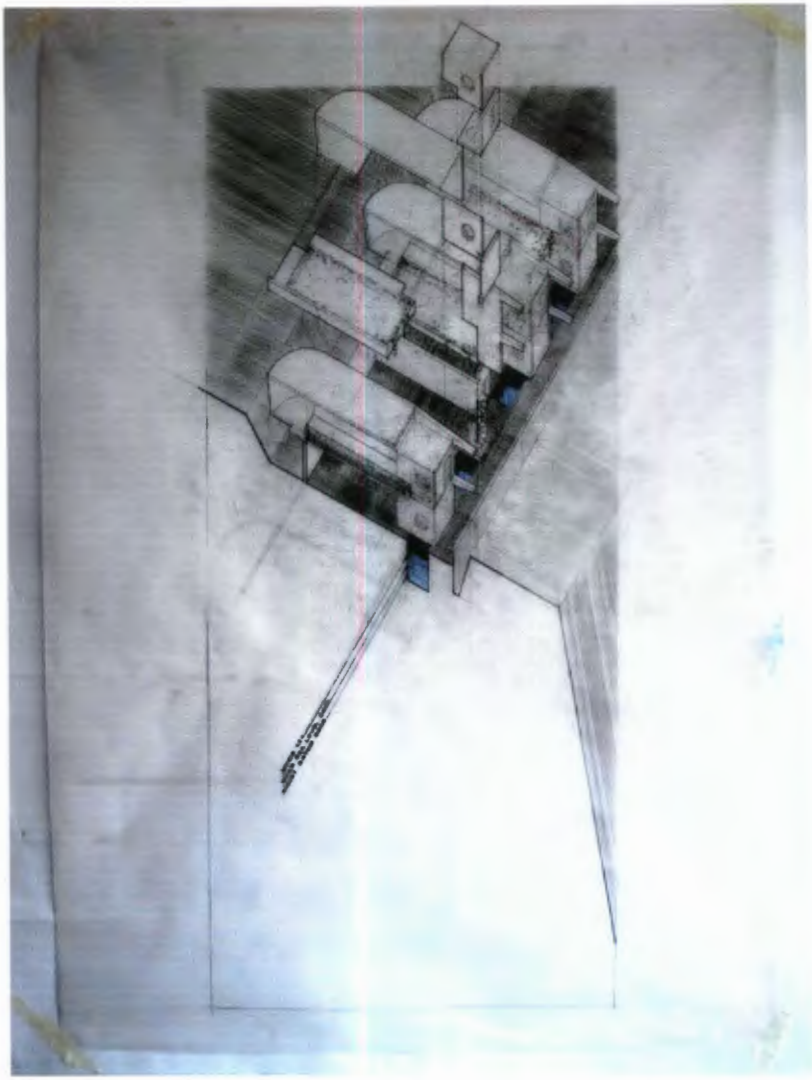




The first floor layout (above) and ground floor layout (below). The ground floor is actually sunken 2 meters below the land levelling datum to give the researchers a sense of privacy.
Opposite page. The spatial dolos is made up out of a kit of prefabricated elements. The ground floor walls are cast in-situ to provide initial support. The kit of parts are then assembled around these, locking together and forming research labs below and office spaces above. The blue cubes are tidal ponds - allowing the sea to wash in to the building connecting the subterranean labs with a daily cycle (to replace the cycle usually observed by the passing of the sun) and to register any variations in sea-level rise.







Theatre of Atmospherics

The teatro del mondo by Aldo Rossi is a beautiful example of an extraordinary theatre. Built on a floating platform it travels around Venice creating unique spatial experiences wherever it docks. Source: Lotus International vol 25.

Opposite page. Images of various measuring instruments that appear in Basil Wilson's PhD thesis. These instruments are fascinating and form an inspiring collection of mechanics that will inform my theatre space.

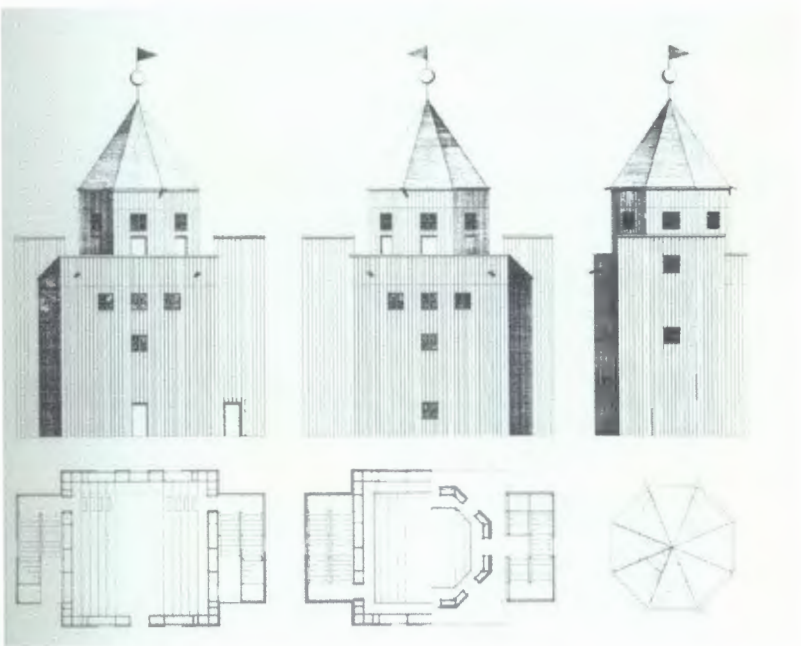


FIG. 144. PHOTOGRAPH OF DYNAMOMETER.

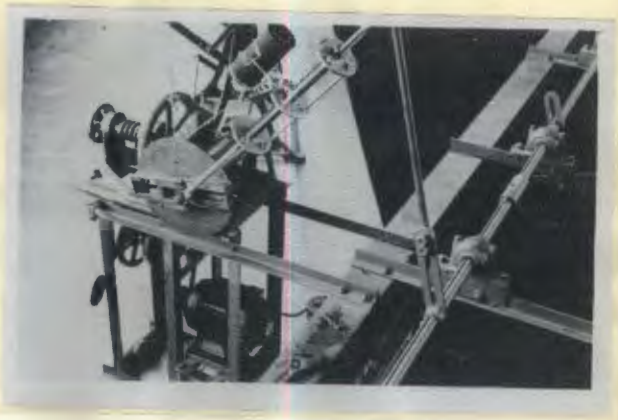
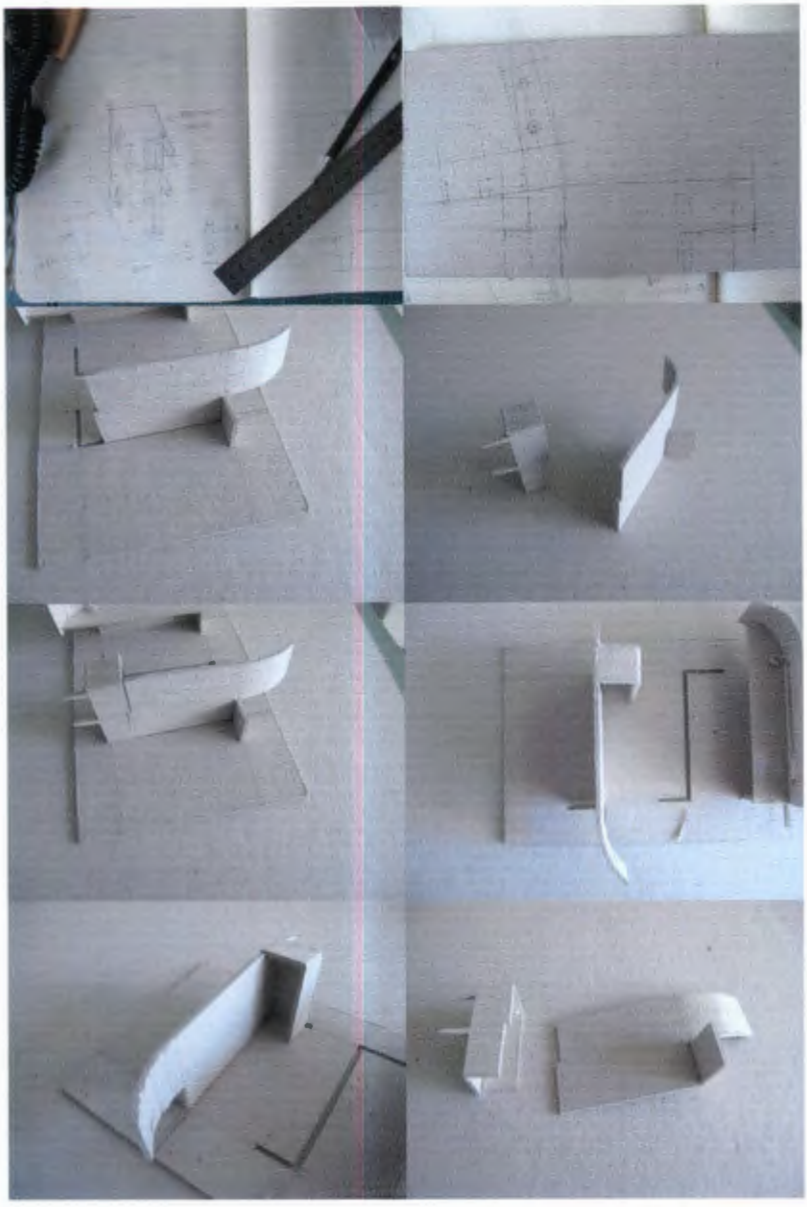


FIG. 145. PHOTOGRAPH OF DYNAMOMETER IN RELATION TO PADDLE DRIVING MACHINERY.

How?

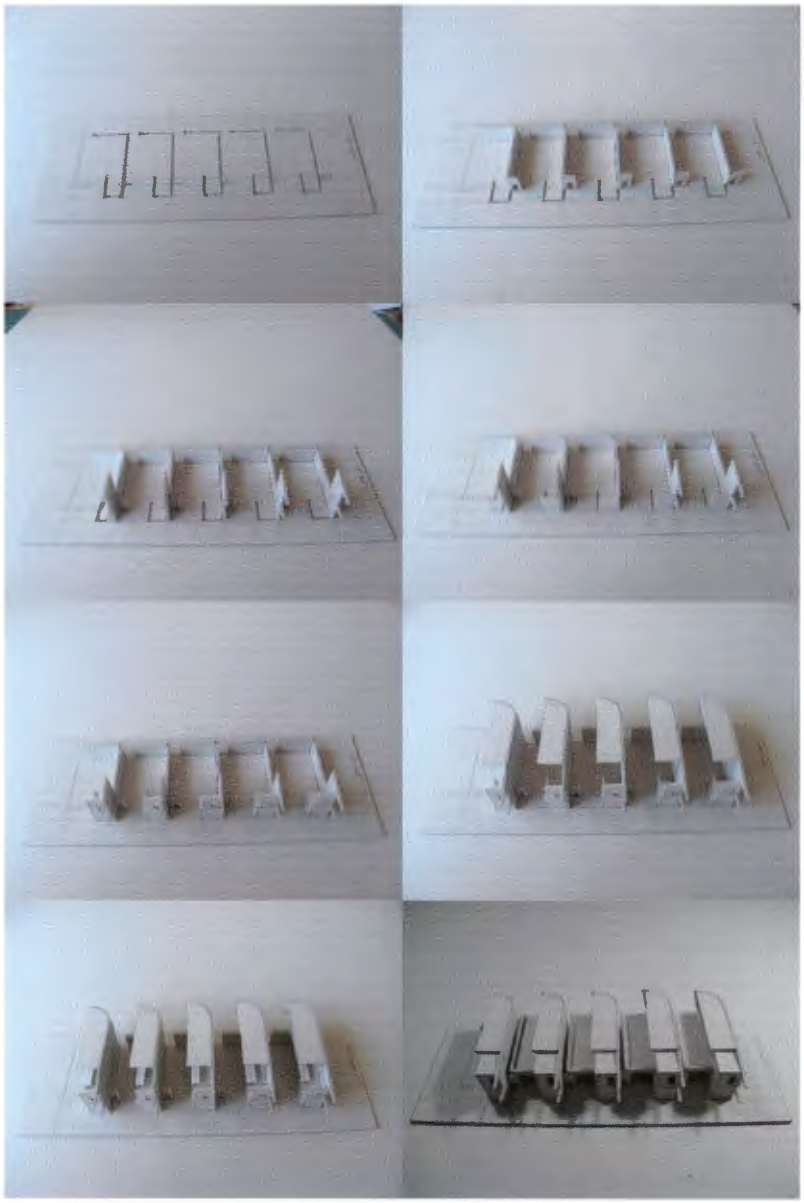
This relates to the technical aspects of my project. I have chosen to focus on the *Spatial Dolos.*
The spatial dolos draws on a long line of pre-casting for inspiration. From Kisho Kurokawa's Nakagin Capsule Tower (stair units) to Moshe Safdie's Habitat '67 (apartment modules), pre-casting has been shown to be an effective means of speeding up the construction process and creating complex shapes out of reinforced concrete.

I started by creating the desired spatial form based on the requirements of the research labs and office spaces and then refined the form based on technical limitations (size and weight of concrete elements that are able to be precast and craned into place economically).
The following images show the process...
This page. Three different options are explored. The winning scheme is the flat roof option that provides a roof garden for each office module plus better light quality in the research facilities. This option can be seen on the top row.
Opposite page. The development of the winning scheme...



This page. The construction process of the spatial dolos. Firstly the in-situ subterranean walls are cast. Then the various pre-cast elements are craned into place.

Opposite page. The various qualities of the spatial dolos. A planted roof forms an outdoor breathing space for the offices. The supportive upstand projects into the office space to form a work desk. The planted roof is pulled back from the abutting spatial dolos to allow reflected light down into the research spaces. The curve of the dolos protects the office balconies form the effects of the vicious Cape Town south-easter. The slight overhang of the office roof provides sun shading for the north-east facing offices. The level change between the office roof and the roof covering the stairwell forms a niche for elements such as air conditioning units, ducts, etc. The butts protruding from the stairwell side of the dolosse provides support for the first floor level walkway.



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My apologies if I have omitted to mention someone personally. There have been many people who have offered assistance that has been greatly appreciated.

This page. Seb Swart of the CSIR inspects a working model of the *Spatial Dolos*.

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Postscript

A **visvywer** is a phenomenon found along the Cape south coast. It is made up of rocks placed in roughly semi–circular formations that straddle the intertidal zone. These rocks form low walls that become submerged during high tide. Whilst submerged, fish that live in the intertidal ecotone are unaware of these man–made traps and swim freely into them. When the tide flows out the fish find themselves trapped behind these walls and become easy–pickings for passers–by.

A heterogeneous space afforded by the path of the moon.

This page. A visvywer (fishtrap) on the Cape south coast. Source: http://farm4.static.flickr.com/

Postpostscript

The SANAP headquarters at the East Pier has a fascinating collection of SANAE (South African National Antarctic Expedition) memorabilia. From photographs, unique stamps and letters, 8mm film, ski-do's, preserved animals, and equipment, it forms a remarkable collection that could find a new home in my proposed visitor centre and atmospheric theatre.

At right. Photographs of the SANAE crew from 1963 to 1970